

职业教育课程改革创新规划教材·精品课程系列

# 电子技术专业英语

Electronic Technology Professional English

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## 内 容 简 介

本书按照教育部中等职业学校电子与信息技术专业《电子技术专业英语》教学大纲及课程标准组织编写。

本书取材新颖,内容充实,基本涵盖了较新且实用的电子技术内容。起点低,容易上手,实用性强。通过学习,使学生不但能够掌握电子与信息技术专业常用的词汇,而且能顺利地阅读、理解有关的英文技术文献和资料,从而熟练使用各种电子仪器进行电子电路的测试和故障诊断。学生积极参与教学的同时也培养了学生沟通表达能力和综合素质。

本书可作为电子电气类、机电类专业中等职业学校专业英语教材,也可作为高职高专相关专业的参考用书。

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## 前言 PREFACE

如何使学生在学习中既感到责任又感到快乐？基于这样的梦想和追求，本教材的编写打破了传统的专业英语教材的风格，主要体现在如下几个方面。

### 1. 教材形式新颖，有亲和力。

本书不拘泥于传统教材中的语法、词汇、阅读等常规套路，而是通过一个个小任务，引入了大量的练习，将语法学习、词汇学习、阅读、写作等穿插在其中。

2. 激发学生的学习兴趣，让学生积极参与教学过程，充分体现了“学中做，做中学”的先进教学理念。

一改以往以教师为主体的传统教学方法，让学生成为教学的主体。先由导入部分引入和本单元相关的问题，可以组织学生开展讨论，帮助读者发现自己不明白的知识点以及表达该话题所需的语言和词汇，这样对下面的学习会更有目的性。教师讲完一个知识点后，学生马上能将所学知识在练习中应用，加深印象，巩固所学知识。培养学生自我学习、自我促进、自我发展的习惯。

3. 所选教学内容难度由简单到复杂，循序渐进。同时涵盖了电子专业所需要的大部分专业知识领域。

教材选用的文章和技术阅读资料来自于目前较主流产品说明书、技术文档及国外教材等，内容丰富，涉及电子专业各个领域。通过学习，使学生掌握科技英语翻译的一些方法和技巧。

### 4. 教学形式多样化，发挥学生团队合作精神。

教材中安排了大量的讨论。通过讨论，让学生自己总结，撰写讨论稿，使更多的学生主动参与进来，养成善于沟通交流和团队协作的好习惯。

本教材按照教育部“中等职业学校电子专业英语教学大纲”组织编写。全书共有 8 个单元，根据学生层次不同，建议每个单元用 6~8 学时。每个单元主要包括课前导入(Lead-in)、情景对话(Dialogue)、阅读(Reading & Read more)、语法(Grammar)。

本书由上海信息技术学校张祁担任主编，武汉市东西湖职业技术学校王云飞担任副主编。其中课前导入、阅读及相关习题、附录等由张祁编写，情景对话和语法部分及相关习题由王云飞编写。全书由张祁负责统稿。

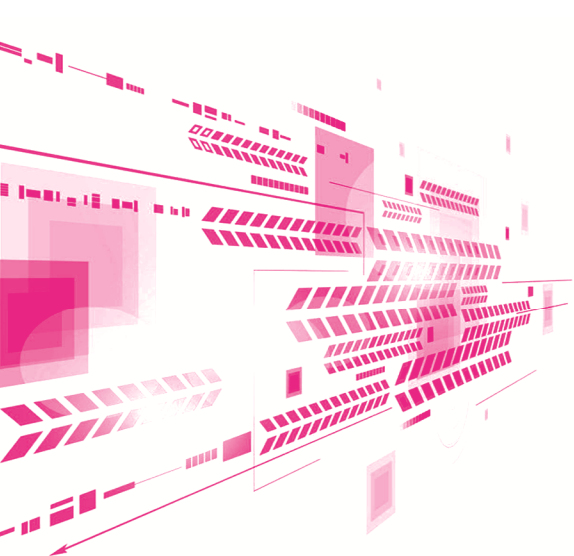
书中部分内容参考了一些专业网站和国内外相关教材。在编写过程中也得到了一些专业技术人员和老师的帮助，在此一并表示衷心的感谢。

由于编者水平有限，书中难免有错漏之处，肯请读者批评指正。联系方式：  
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编者

2014.11





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# Unit 1

## Electronics in the Home



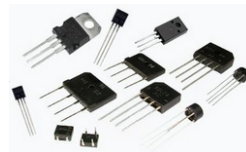
### Part 1 Lead-in

**Task 1** Match the types of the devices to the pictures 将  
以下设备与图片进行匹配。

transistor, microprocessor, microwave, oven, washing-machine, vacuum,  
tube tape recorder



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



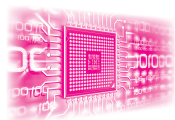
4. \_\_\_\_\_



5. \_\_\_\_\_



6. \_\_\_\_\_



## Part 2 Dialogue

### How much is it?

A : Can I help you, sir?

B : Well, I'm looking for a washing machine.

A : What about this one? It's very good.

B : How much is it?

A : 5,300 yuan.

B : I'm afraid it's too expensive. Do you have a cheaper one?

A : Have a look at this one, it's only 3,600 yuan.

B : Is there a discount?

A : No, it's a sale price.

B : OK, I'll take it .

### Everyday English

- 1 . I'm afraid it's too expensive. 恐怕太贵了。
- 2 . Do you have a cheaper one? 有便宜点的吗?
- 3 . Is there a discount? 可以打折吗?
- 4 . It's a sale price. 这已经是优惠价了。

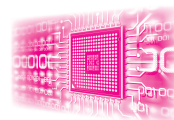


## Part 3 Reading

### Electronics in the home

Electronics began at the start of the twentieth century with the invention of the vacuum tube. The first devices for everyday use were radios, followed by televisions, record players, and tape recorders. These devices were large and used a lot of power.

The invention of the transistor in 1947 meant that much smaller, low-powered devices could be developed. A wide variety of electronic



devices such as hi-fi units and portable radios became common in the home.

It was not until 1958 that microelectronics began with the development of ICs (Integrated Circuits) on silicon chips. This led to a great increase in the use of electronics in everyday items. The introduction of the microprocessor allowed electronics to be used for the control of many common processes.

Microprocessors are now used to control many household items such as automatic washing-machine, dishwashers, central heating systems, and food processors. Electronic timers are found in digital alarm clocks, water heaters, and microwave ovens.

In the future, electronics are likely to become even more common in the home as multimedia entertainment systems and computer-controlled robots are developed.

**Task 2** Fill in the gaps in this table with the help of the text  
根据文章，完成下列表格。

Date	Invention	Applications in the home
Early 20 <sup>th</sup> century		
	transistor	
1958		automatic washing-machines
future	-	

**Task 3** Make your choice according to the passage 根据文章，完成以下选择题。

1. \_\_\_\_\_ were used in the earliest radios.

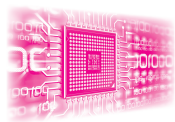
A. Vacuum tubes    B. Transistors    C. ICs

2. We call radios which can be put in the pocket \_\_\_\_\_ radios.

A. transistor    B. portable    C. electronic

3. \_\_\_\_\_ are used in almost all the electronic devices now.





A. Electronics

B. Integrated circuit

C. Vacuum tube



## Part 4 Notes

1. The first **devices** for everyday use were radios, **followed by** televisions, record players, and tape recorders.

日常使用的第一批设备是收音机，其后是电视机、留声机和磁带录音机。

(1) the first devices 中的 devices 为复数形式。复数名词在翻译时可译为“一些”“一批”“各种”等，使其突出复数的意义。又如：

The **ICs** (Integrated Circuits) were developed in 1958.

1958 年发明了第一批集成电路芯片。

(2) followed by... 为过去分词短语，作状语。

2. A wide variety of electronic devices **such as** hi-fi units and portable **radios** became common in the home.

各种形式的电子设备在家庭中变得很普遍，例如高保真的组合音响和便携式收音机等。

句子中的 such as...radios 为同位语，表示列举，修饰 devices，它将主语和谓语隔离了。又如：

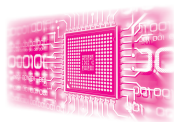
He likes sports very much, **such as football, swimming and table tennis.**

他非常喜欢体育运动，如足球、游泳和乒乓球。

3. In the future, electronics **are likely to** become even more common in the home as multimedia entertainment systems and computer-controlled robots are developed.

将来，当多媒体娱乐系统和计算机控制的机器人发展起来时，电子学有可能在家庭中变得更加普遍。

句子中的 be likely to 解释为“有可能”，通常暗示从表面迹象来判



断。又如:

**I'm hardly likely to** finish it within a week.

我不可能在一周内把它干完。



## Part 5 Grammar

### Tense 时态

1. Electronics began at the start of the twentieth century.
2. The first devices for everyday use were radios.
3. It was not until 1958 that microelectronics began with the development of ICs on silicon chips.
4. Electronic timers are found in digital alarm clocks, water heaters, and microwave ovens.

### 一、一般现在时

#### 1. 概念

(1) 表示反复或习惯发生的动作。

I go to school at 7 o'clock every day.

(2) 表示现在存在的状态或特征。

The book is on the desk.

(3) 表示永恒的真理。

The earth goes round the sun.

#### 2. 时间状语

always, often, sometimes, usually, every day/week/month/year

#### 3. 基本结构

(1) (I/you/we/they) + 动词原形 (do) I make a snowman.

(2) (he/she/it) + 动词的第三人称单数形式 (does) She goes to school on foot.



(1) 否定句: am/is/are + not      I am not a doctor.  
don't + 动词原形      I don't like washing.  
doesn't + 动词原形      She doesn't like washing.

(2) 一般疑问句: Am/Is/Are 放于句首 Are you in Class two?

Do + ... + 动词原形...?      Do you like some bread?

Does + ... + 动词原形...? Does she go to the park?

## 1. 概念

(1) 表示过去某时间发生的动作或存在的状态。

I got up at 6 this morning.

(2) 表示过去的习惯或经常发生的动作。

He smoked many cigarettes a day until he gave up.

yesterday, the day before yesterday, last night/week/month/year, in 1999,  
just now, this morning, ago

主语 + be 动词过去式(was\were)      He was my girlfriend.  
主语 + 动词过去式(did)                      He used to smoke a lot.

(1) 否定句: was\were + not

I was at my uncle's home last month.

didn't + 行为动词原形

I didn't finish my homework yesterday.

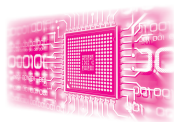
(2) 一般疑问句: Was\Were 放于句首

Where were you last week?

### Did + ... + 动词原形 ... ?

Did you go shopping this morning?





### 三、一般将来时

#### 1. 概念

表示将来某个时间要发生的动作或存在的状态。

She will be back here tomorrow afternoon.

#### 2. 时间状语

tomorrow, next day/week/month/year, the day after tomorrow, tonight, this evening

#### 3. 基本结构

am/is/are going to + 动词原形(do)      It is going to rain.

will/shall + 动词原形(do)      I will be a teacher.

#### 4. 变换句型

(1) 否定句: am/is/are + not + going to + 动词原形(do)

I am not going to watch a movie.

will/shall + not + 动词原形(do)

Susan will not play with a toy car.

(2) 一般疑问句: ① am/is/are 放于句首

Is she going to see her grandpa?

will/shall 放于句首

Shall we go to the zoo tomorrow?

### 四、现在进行时

#### 1. 概念

(1) 表示说话者正在进行的持续的动作

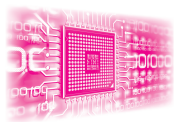
Look! He is cleaning the car.

(2) 表示当前一外段时间或现阶段下在进行的动作。

What are you doing these days?

(3) 有些动词以现在进行时表示将要发生的动作。

We are leaving for Beijing.



## 2. 时间状语

now, right now, Look! Listen!

## 3. 基本结构

am/is/are + 动词现在分词(doing)      He is doing well in his lessons.

## 4. 变换句型

(1) 否定句: am/is/are + not + 动词现在分词(doing)

I'm not playing basketball.

(2) 一般疑问句: am/is/are 放于句首

Is Tom speaking in the room?

# 五、现在完成时

## 1. 概念

(1) 表示动作发生在过去某个时间, 对现在留下了影响和结果。

I have just had lunch.

(2) 表示从过去某一时刻开始一直持续到现在的动作或状态。

He has taught here since 1980.

## 2. 时间状语

already, yet, never, just, for + 一段时间, since + 过去时间点

## 3. 基本结构

have/has + 动词过去分词(done)      I have written an article.

## 4. 变换句型

(1) 否定句: have/has + not + 动词过去分词(done)

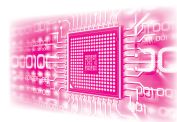
I have not been to Beijing

(2) 一般疑问句: have/has 放于句首

Have you finished your homework yet?

# Task 4 Look and write 按要求改写句子。

1. Susan watches TV every evening. (改成否定句)



- 2 . I'm playing the football in the playground. (对画线部分提问)
- 3 . We went to school early yesterday. (改成一般疑问句)
- 4 . Will the flowers come out next week? (作否定回答)
- 5 . The bus has arrived here. It arrived here ten minutes ago. (把两个句子合并成一个句子)

### Task 5 Think and complete 用动词的正确形式完成句子。

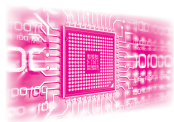
- 1 . Lily often \_\_\_\_\_ (have) dinner at home.
- 2 . \_\_\_\_\_ you \_\_\_\_\_ (buy) a new watch tomorrow?
- 3 . I \_\_\_\_\_ (not find) my exercise book yet.
- 4 . There \_\_\_\_\_ (be) a telephone call for you just now.
- 5 . They \_\_\_\_\_ (not water) the flowers now.
- 6 . \_\_\_\_\_ your parents \_\_\_\_\_ (have) eggs every day?
- 7 . Look! The girls \_\_\_\_\_ (dance) in the classroom.
- 8 . \_\_\_\_\_ he \_\_\_\_\_ (come) to school at 6 o'clock this morning?
- 9 . I \_\_\_\_\_ already \_\_\_\_\_ (see) the film.
- 10 . Mike \_\_\_\_\_ (believe, not) this until he sees it with his own eyes.



## Part 6 Read more

### Electricity and electronics

Electricity is a science of the power which can be used to produce heat and light, and to drive machines, while electronics is the scientific study and application of electron devices, such as electron tubes, transistors, integrated circuits and so on. In 1800 Volta made his experimental cell, producing a steady current, which laid a foundation of electricity. The study of electricity and electronics is different, but they have a close relationship. Many



principles are commonly used in both fields.

### Task 6 Try to match the following columns 英英配对。

- |                 |  |
|-----------------|--|
| 1 . electronics | a . a hundred years  |
| 2 . electricity | b . science of the power produced by chemical means          |
| 3 . audio       | c . the scientific study and application of electron devices |
| 4 . video       | d . carrying easily  |
| 5 . century     | e . television   |
| 6 . portable    | f . of hearing   |

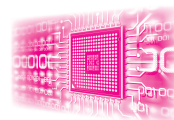
### Task 7 Try to match the following columns 中英配对。

- |            |                              |
|------------|------------------------------|
| 1 . 21 世纪  | a . daily life               |
| 2 . 便携式电脑  | b . the first televisions    |
| 3 . 日常生活   | c . portable computer        |
| 4 . 第一批电视机 | d . the twenty-first century |



## Part 7 New words & Expression

electronics	[ɪˌlek'trɒnɪks]	<i>n.</i> 电子学
electronic	[ɪˌlek'trɒnɪk]	<i>a.</i> 电子的
century	['sentʃəri]	<i>n.</i> 世纪
invention	[ɪn'venʃn]	<i>n.</i> 发明
vacuum tube		真空管, 电子管
record player		留声机
tape recorder		磁带录音机
transistor	[træn'zɪstə(r)]	<i>n.</i> 晶体管、三极管



portable	['pɔ:təbl]	a.	便携式的
microelectronics	[,maɪkrəʊɪ,lek'trɒnɪks]	n.	微电子学
introduction	[,ɪntrə'dʌkʃn]	n.	引入
development	[dɪ'veləpmənt]	n.	发展
integrated circuit			集成电路
silicon chip			硅片
microprocessor	[,maɪkrəʊ'prəʊsesə(r)]	n.	微处理器
household		n.	家庭
		a.	家庭的, 家常的
automatic	[ɔ:tə'mætɪk]	a.	自动的, 自动化的
washing-machine	['wɒʃɪŋməʃ'i:n]	n.	洗衣机
dishwasher	['dɪʃwɒʃə(r)]	n.	洗碗机
timer	['taɪmə(r)]	n.	定时器, 计时器
microwave	['maɪkrəweɪv]	n.	微波
multimedia	[,mʌlti'mi:diə]	n.	多媒体
electricity	[ɪ,lek'trɪsəti]	n.	电学
experimental	[ɪk,sperɪ'mentl]	a.	实验性的
cell	[sel]	n.	电池
principle	['prɪnsəpl]	n.	原则; 原理
discount	['dɪskaʊnt]	v.	打折扣



# Unit 2

## Component Values



### Part 1 Lead-in

**Task 1** Fill in the missing colors in the table with the help of the text 补充表中所缺的颜色。

0—black

1—

2—

3—orange

4—

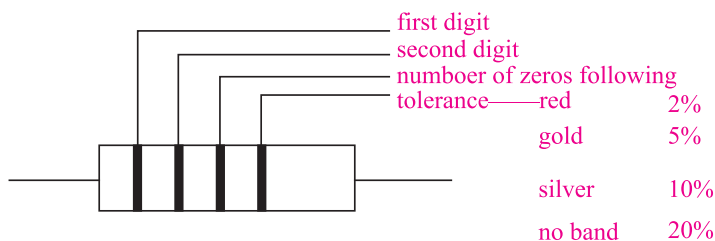
5—green

6—blue

7—violet

8—

9—white



### Part 2 Dialogue

**Return or exchange the goods**

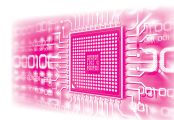
A : Hi, there's a problem with this stereo. I'd like to return it , please.

B : What's the problem?

A : The tape player doesn't work.

B : OK. Do you have your receipt?

A : Yes, here you are.



B : Thank you. Do you want your money back, or would you like to exchange it?

A : I think I'd like to just get another stereo, please.

B : OK. Here's a receipt for store credit. Just take it back to the stereo section and one of our salesmen will help you.

A : Thanks a lot.

B : No problem. Thank you.

## Everyday English

1. There's a problem with this stereo. 这台音响有点问题。
2. Do you have your receipt? 你有收据吗?
3. Do you want your money back, or would you like to exchange it?  
你是想退货还是换台新的?
4. Here's a receipt for store credit. 这是我们商店退货单的单据。
5. Just take it back to the stereo section and one of our salesmen will help you. 把它拿去音响部, 售货员会帮您的。



## Part 3 Reading

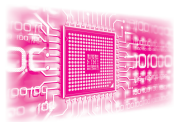
### Reading the resistor code

Resistors are coded with colored bands to ease the problem of marking such small components.

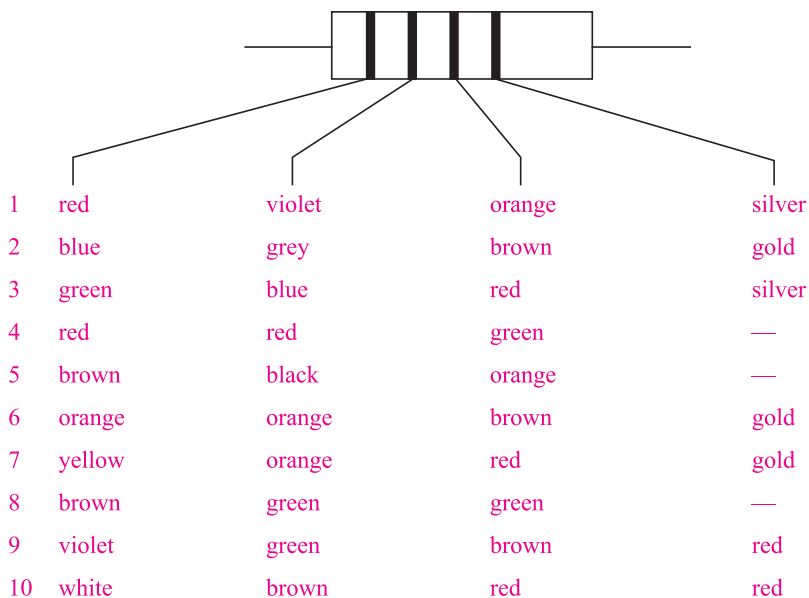
The numbers corresponding to the ten colors used and the values per position are shown above.

For example, 180,000 ohms is coded with the first digit brown, then grey and finally yellow. The fourth band indicates the tolerance that the value has with respect to the stated value. For example, silver indicates 10% tolerance, meaning that the 180,000 ohms could vary between  $180,000 \pm 18,000$ , i.e. 162,000 to 198,000.

These tolerances may seem to reflect poor manufacture but in most circuits they are, in fact, quite satisfactory. Relaxing the tolerance enables the maker to sell them more cheaply.



**Task 2** Find the values and tolerance of resistors band ed as follows. Then compare your answer with your partner 写出电阻阻值及允许误差。



## Part 4 Notes

1. The numbers **corresponding to** the ten colors used and the values per position are shown above.

10 个数字与 10 种所用颜色一一对应，而且每个位置的值已在上面标出。

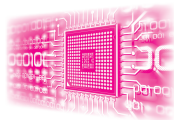
句子中的 corresponding to 解释为“相当于……”“与……相一致”。又如：

Please give nouns **corresponding to** these verbs and adjectives.  
请写出这些动词和形容词相应的名词。

2. The fourth band indicates the tolerance that the value has **with respect to** the stated value.

第四个色环表明该电阻实际值相对于标准值的允许误差。

句子中的 with respect to 解释为“关于”“相对于”“就……而论”。又如：



Parents often have little choice **with respect to** the way their child is medically treated.

关于孩子的治疗方法,父母通常没有什么选择的余地。

3. For example, silver indicates 10% tolerance, meaning that the 180,000 ohms could vary between  $180,000 \pm 18,000$ , **i.e.** 162,000 to 198,000.

例如,银色表示 10% 的偏差,这就意味着标值  $180\text{k}\Omega$  的电阻,其阻值可在  $180\text{k}\Omega \pm 18\text{k}\Omega$  之间变化,也就是说,从  $162\text{k}\Omega$  到  $198\text{k}\Omega$ 。

句子中的 i.e. 是缩写形式, abbr.(=id est) <拉> 即, 换言之。又如:

**e.g.** 是拉丁文 *exempli gratia* 的缩写,意思是举个例子“比如”。等同于“for example”,目的是用例子来说明前面的观点,用法与 for example 相同。

**etc.** 是 *et cetera* 的缩写,意思是“等等”,相当于“and so on”。  
可用来列举事物,若要列举人,则需用 *et al.* 或用 *and others*。



## Part 5 Grammar

### Passive Voice 被动语态

1. Resistors are coded with colored bands to ease the problem of marking such small components.

2. The numbers corresponding to the ten colors used and the values per position are shown above.

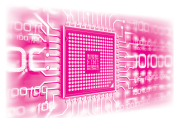
3. For example, 180,000 ohms is coded with the first digit brown, then grey and finally yellow.

4. The window was blown by wind.

5. A speech will be given this afternoon.

#### 一、概述

语态是动词的一种形式,用以说明主语与谓语动词之间的关系。英语的语态共有两种:主动语态和被动语态。主动语态表示主语是动作的执行者,被动语态表示主语是动作的承受者。汉语往往用“被”“受”



“给”等词来表示被动意义。如:

They didn't offer Ann the job. (主动语态)

Ann wasn't offered the job. (被动语态) 安没得到这份工作。

## 二、结构

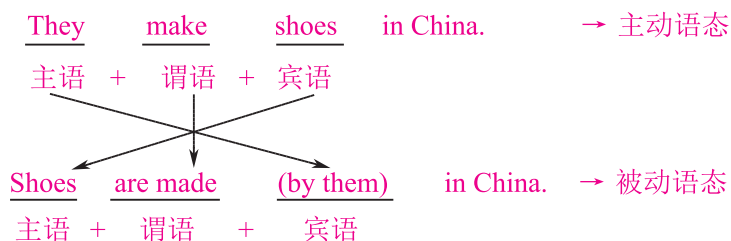
助动词 be+及物动词的过去分词

## 三、动词过去分词的变化规则

动词原形	过去式	过去分词
learn	learned	learned
produce	produced	produced
study	studied	studied
play	played	played
plan	planned	planned

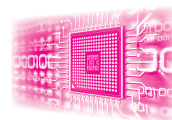
动词原形	过去式	过去分词
let	let	let
find	found	found
come	came	come
take	took	taken
make	made	made

## 四、主动语态变为被动语态



**Task 3** Find the statements that are passive voice 找出被动语态的句子。

1. His mother is dressed in white at the party.
2. The classroom was cleaned by the students.
3. I think that he is right.
4. What are these brushes used for?
5. He would not be taken to Beijing.
6. Do you water your flowers every day?



## Task 4 Fill in the blanks with the correct form of the verb 用所给动词的正确形式填空。

Paper 1 (create) about 2,000 years ago. People 2 (learn) to write words on paper to make a book. But in those days, books could only 3 (produce) one at a time by hand. As a result, they 4 (be) expensive and rare. Then printing 5 (invent) in China. The first printed books 6 (make) by putting ink on a wooden block and holding the paper against it. When printing 7 (develop) greatly at the beginning of the 11<sup>th</sup> century, books could 8 (produce) more quickly and cheaply. As a result, more people 9 (learn) to read.



## Part 6 Read more

### Understanding electronic diagrams

Although electronic devices may look complicated, they are made up of common basic units (building block) connected together. The function of each of these units and the path of the signals between them can be shown in a block diagram. For example, the block diagram of a simple radio is shown in Fig.1.

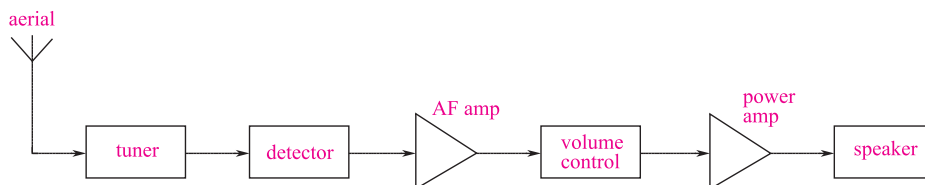
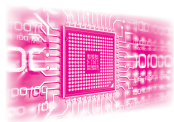


Fig.1 The block diagram of a simple radio

To understand how the radio works, it is more important to understand the function of each unit than to know what components are used. This is known as a systems approach to electronics. For example, in Fig.1 the tuner selects the required signal, the detector then separates off the audio part of



the signal, and the AF amplifier (amp) amplifies it.

The connections and values of the components inside these basic units can be shown in a circuit diagram using standard electronic symbols. Fig.2 shows the circuit diagram for the simple radio.

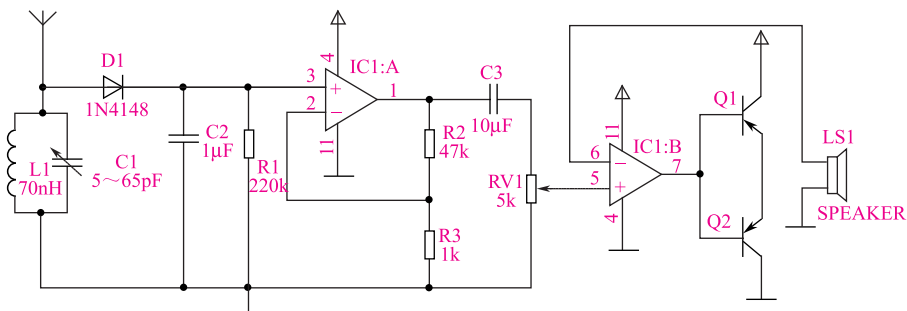
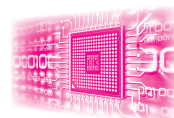


Fig.2 Circuit diagram for the simple radio

The volume control consists of a ten-microfarad electrolytic capacitor connected in series with a five- kilohm potentiometer (pot). The positive terminal of the capacitor is connected to the output of the AF amplifier and the wiper of the pot is connected to the power amp. The third terminal of the pot is connected to the zero voltage supply rail, which is earthed.

**Task 5** This table provides the terms you need. Describe the value of these components with the help of the table  
描述表格中各元器件的值。

Prefix	Symbol	Multiple	Example
giga	G	10 <sup>9</sup>	GHz gigahertz
mega	M	10 <sup>6</sup>	MΩ megaohms
kilo	K	10 <sup>3</sup>	kV kilovolts
milli	m	10 <sup>-3</sup>	mW milliwatts
micro	μ	10 <sup>-6</sup>	μH microhenries
nano	n	10 <sup>-9</sup>	nF nanofarads
pico	p	10 <sup>-12</sup>	pF picofarads



R1	a two-hundred and twenty-kilohm resistor
C1	
R2	
C2	a one-microfarad capacitor
L1	
R3	

**Task 6** Describing block diagrams and circuits, fill in the gaps in this description of the tuned circuit shown in Fig.2. Each gap represents one word 按照例句描述图2的方块图和电路，每个空格填入一个单词。

- The radio **consists of** a tuner, a detector, and an AF amplifier.  
The radio **is composed of** a tuner, a detector, and an AF amplifier.
- The tuner **is connected to** the detector.  
The tuner **is linked to** the detector.

The circuit   1   of a four hundred and seventy   2   inductor which is connected in parallel with a   3   capacitor.

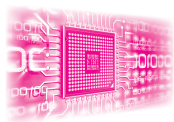
The   4   can be varied between five and sixty-five   5  . The aerial is   6   to the top of the tuner. It is also connected to the positive terminal of the   7   in the detector. The bottom end of the tuner is connected to earth via the zero voltage supply rail.



## Part 7 New words & Expression

component	[kəm'pəʊnənt]	<i>n.</i>	元器件
resistor	[rɪ'zɪstə(r)]	<i>n.</i>	电阻器
color band			色环
capacitor	[kə'pæsɪtə(r)]	<i>n.</i>	电容器



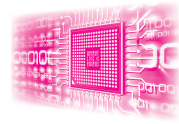


## 电子技术专业英语

课堂随笔 

inductor	[ɪn'dʌktə]	<i>n.</i>	电感器
position	[pə'zɪʃn]	<i>n.</i>	位置
tolerance	['tɒlərəns]	<i>n.</i>	公差; 允许误差
stated value			标称值
relax	[rɪ'læks]	<i>v.</i>	(使) 放宽
ohm	[əʊm]	<i>n.</i>	<电>欧姆; 电阻单位
violet	['vaɪələt]	<i>a.</i>	紫色的
electronic diagram			电子电路图
complicated	['kɒmplɪkətɪd]	<i>a.</i>	结构复杂的
building block			标准部件
function	['fʌŋkʃn]	<i>n.</i>	功能; 函数
signal	['sɪgnəl]	<i>n.</i>	信号
approach to			接近
tuner	['tju:nə(r)]	<i>n.</i>	调谐器
aerial	['eəriəl]	<i>n.</i>	[电讯]天线
detector	[dɪ'tektə(r)]	<i>n.</i>	探测器, 检波器
AF amp			音频放大器
Amplifier	['æmplɪfaɪə(r)]	<i>n.</i>	放大器
amplify	['æmplɪfaɪ]	<i>v.</i>	放大
electronic symbol			电子符号
power amp			功率放大器
speaker	['spi:kə(r)]	<i>n.</i>	扬声器
volume	['vɒlju:m]	<i>n.</i>	音量, 体积
microfarad	[,maɪkrəʊ'færəd]	<i>n.</i>	微法拉
nanofarad	['neɪnə'færəd]	<i>n.</i>	纳法拉, 毫微法拉
picofarad	[pɪkə'færəd]	<i>n.</i>	皮法拉, 微微法拉
gigahertz	['gɪgəhɜ:ts]	<i>n.</i>	千兆赫
megavolt	['megəvɒlt]	<i>n.</i>	兆伏
milliwatt	['mɪlɪwɒt]	<i>n.</i>	毫瓦
microhenry	['maɪkrəhenrɪ]	<i>n.</i>	微亨利
electrolytic	[ɪ,lektərə'lɪtɪk]	<i>a.</i>	电解的
in series			串联
kilohm	['kɪləʊm]	<i>n.</i>	千欧姆

## Unit 2 Component Values



课堂随笔

potentiometer	[pəˌtenʃiˈɒmɪtə(r)]	<i>n.</i>	电位计
wiper	['waɪpə(r)]	<i>n.</i>	滑片
terminal	['tɜːmɪnəl]	<i>n.</i>	(电路的) 端子
supply rail			电源导轨
earth	[ɜːθ]	<i>v.</i>	(把电线) 接地
stereo	['steriəʊ]	<i>n.</i>	立体声系统
receipt	[rɪ'siːt]	<i>n.</i>	收据; 发票
exchange	[ɪks'tʃeɪndʒ]	<i>v.</i>	调换; 交换

# Unit 3

## Electronic Components



### Part 1 Lead-in

**Task 1** Match the types of the components to the pictures  
将以下元件与图片进行匹配。

diode ,integrated circuit ,inductor ,capacitor ,LED ,transistor ,resistor



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



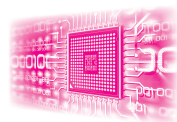
4. \_\_\_\_\_



5. \_\_\_\_\_



6. \_\_\_\_\_



## Part 2 Dialogue

### My new cell phone

A : Hey! I just bought a new cell phone!

B : What does it do?

A : It's got a built-in video camera so you can see the person you're talking to and use the e-mail mode to send digital pictures to your friend.

B : Wow! What else does it do?

A : I can plug it into a folding keyboard to type in message mode. I can even surf the net.

B : Cool! Anything else?

A : Yes. With the 600-second digital memory, I can record my voice and send it using voice message mode.

B : Wow!

A : You can try the same one, I'm sure you'll love it!

### Everyday English

1. What does it do?      你的新手机都有什么功能呀?

2. It's got a built-in video camera so you can see the person you're talking to and use the e-mail mode to send digital pictures to your friend.

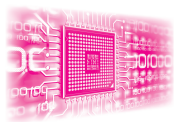
它有一个内置摄像头，这样你在通话的时候就可以看到对方了。还可以把数码照片发给朋友。

3. I can plug it into a folding keyboard to type in message mode. I can even surf the net.

还可以插上一个可折叠的键盘，这样就可以在短信模式下进行文字录入了。我甚至还可以用手机上网。

4. With the 600-second digital memory, I can record my voice and send it using voice message mode.

它还有一个 600 秒的数字存储器，我可以把声音录下来，再通过语音信息模式发给别人。



## Part 3 Reading

### Knowing the electronic components

There are a large number of symbols which represent an equally large range of electronic components. It is important that you can recognize the more common components and understand what actually they do. A number of these components are drawn below and it is interesting to note that often there is more than one symbol represent the same type of the component.

#### Resistors

Resistors restrict the flow of electric current, for example, a resistor is placed in series with a light-emitting diode (LED) to limit the current passing through the LED. Fig.1 shows resistor example and circuit symbol.

Resistors may be connected either way round. They are not damaged by heat when soldering.

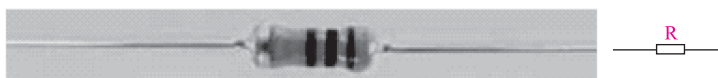


Fig.1 Resistor example and circuit symbol

#### Capacitors

Capacitors store electric charge. They are often used in filter circuits because capacitors easily pass AC(changing) signals but they block DC(constant) signals. Fig.2 shows capacitor examples and circuit symbol.

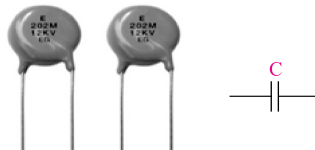
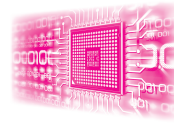


Fig.2 Capacitor example and circuit symbol

#### Inductor

An inductor is a passive electronic component that stores energy in the form of a magnetic field. An inductor is a coil of wire with many windings,



often wound around a core made of a magnetic material, like iron. Fig.3 shows inductor examples and circuit symbol.



Fig.3 Inductor examples and circuit symbol

## Diode

Diodes allow electricity to flow in only one direction. The arrow of the circuit symbol shows the direction in which the current can flow. Diodes are the electrical version of a valve and early diodes were actually called valves. Fig.4 shows diode examples and circuit symbol.

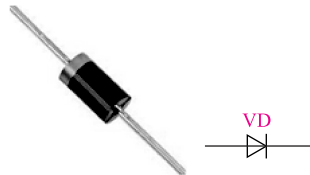


Fig.4 Diode example and circuit symbol

## Transistors

There are two type of standard transistors, NPN and PNP, with different circuit symbols. The letters refer to the layers of semiconductor material used to make the transistor. Fig.5 shows transistors examples and circuit symbol.

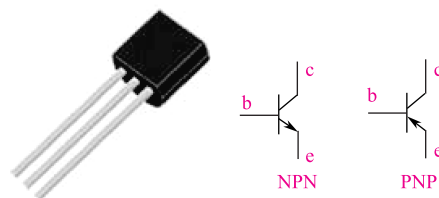
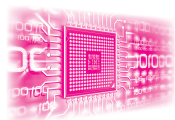


Fig.5 Transistors examples and circuit symbol

## Integrated circuits(chips)

Integrated circuits are usually called ICs or chips. They are complex circuits which have been etched onto tiny chips of semiconductor(silicon). The chip is packaged in a plastic holder with pins spaced on a 0.1 inch(2.54 mm) grid which will fit the holes on stripboard and breadboard. Very fine



wires inside the package link the chip to the pins. Fig.6 shows integrated circuit example.



Fig.6 Integrated circuit example

## Light emitting diodes(LEDs)

LEDs emit light when an electric current passes through them. LEDs must be connected the correct way round, the diagram may be labelled “A” or “+” for anode and “K” or “-” for cathode. The cathode is the short lead and there may be a slight flat on the body of round LEDs. Fig.7 shows LED examples and circuit symbol.

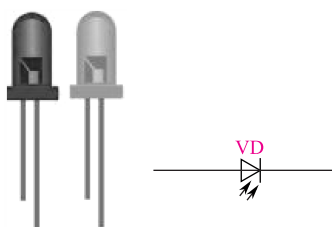
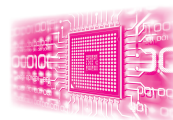


Fig.7 LED examples and circuit symbol

**Task 2** Write T (True) or F (False) beside the following statements about the text 根据文章判断正误。

1. One symbol represents a type of component. ( )
2. Resistors are damaged by heat when soldering. ( )
3. Capacitors are not often used in filter circuits. ( )
4. Both capacitor and inductor are passive electronic component. ( )
5. Inductor store electric charge. ( )
6. Diodes also called valves. ( )
7. The symbol of NPN and PNP transistors is same. ( )



8. ICs are complex circuit which have been etched onto tiny chips of semiconductor. ( )
9. LEDs is one type of diodes. ( )
10. The letter “c” represents the cathode of a diode. ( )

**Task 3** Match the following terms to appropriate definition or expression 词义配对。

- |                  |   |
|------------------|---|
| 1. AC            | a. A tiny “chip” containing many individual circuits which work together to perform a function. |
| 2. DC            | b. A material that is neither a conductor nor an insulator.                                     |
| 3. IC            | c. The direction of current is constant.  |
| 4. Semiconductor | d. It changes polarity periodically.  |

**Task 4** Fill in the missing words according to the text 根据文章补全语句。

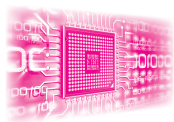
1. In the common components, \_\_\_\_\_ may be connected either way round.
2. \_\_\_\_\_ is a passive electronic component that store electric charge.
3. Inductors store energy in the form of \_\_\_\_\_.
4. Diodes allow electricity to flow in one \_\_\_\_\_.
5. The \_\_\_\_\_ of the LED is the short lead and there may be a slight flat on the body of round LEDs.



## Part 4 Notes

1. There are **a large number of** symbols which represent an





equally large range of electronic components.

大量的符号代表了同样多的电子元件。

句中的 a large number of 解释为“很多的”“大量的”。后面跟复数形式的可数名词。如果是 a large amount of, 则后面跟不可数名词。

2. They are often used in filter circuits because capacitors easily pass **AC**(changing) signals but they block **DC**(constant) signals.

因为电容允许交流信号通过而阻隔直流信号。所以它们经常被用在滤波电路中。

句中的 AC, 即 alternating current, 解释为“交流电”; DC, 即 direct current, 解释为“直流电”。又如:

Either direct or alternating current may be used for driving electric trains.

直流电和交流电都可用来驱动电气火车。

3. The arrow of the circuit symbol shows the direction **in which** the current can flow.

电路符号的箭头指示了电流能流过的方向。

句子中关系代词 which 引导限制性定语从句。介词 in 提前, in which 用来代替 that。又如:

There are many ways **in which (=that)** we can solve the problem.

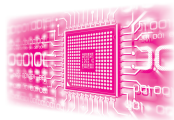
4. The letters **refer to** the layers of semiconductor material used to make the transistor.

字母(N 和 P)意味着制造晶体管的半导体材料的不同。

句中的 refer to 解释为“指的是”“涉及”。又如:

Symbols are signs that **refer to** the object by a convention.

标志是一种人们习惯性指代某种事物的符号。



## Part 5 Grammar

### It 的用法

1. It is important that you can recognize the more common components and understand what actually they do.

2. It is interesting to note that often there is more than one symbol represent the same type of the component.

#### 一、概述

在英语中，It 的使用相当广泛，它既可用作代词，如人称代词、指示代词及非人称代词，也可用作引导词和强调结构中的强调词。

#### 二、用法

##### 1. 作人称代词

作人称代词的 **it** 不仅可以指物或事，也可以指人。它的主要功能是指代，代替一个词组或整个句子，以免重复。

Is **it** a boy or a girl? （指人）

I dropped my watch and **it** broke. （指事物）

Nothing is wrong, is **it**? （代替某些代词）

##### 2. 作非人称代词

It 作非人称代词，常常用作句子的主语，此时它并不指代上下文中提到的人或物，而是用来表示天气、日期、时间、温度、距离等。

**It** is half past four now. （指时间）

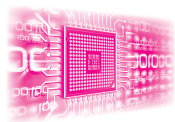
**It** was snowing when I left. （指天气）

How far is **it** to your office? （指距离）

How is **it** going with you? （指环境或情况）

##### 3. 作形式主语

It 作形式主语时没有具体的意义，而只是帮助把真正的主语移到句子后边去，使句子显得平衡一些。It 作形式主语时，可以代替三种形式：



不定式、动名词和主语从句。

**It** is not right to use these places as rubbish dumps. (代替不定式)

**It** is a waste of time watching TV. (动名词短语)

**It** is a pity that the engineer couldn't come. (代替主语从句)

#### 4. 作形式宾语

当不定式(短语)、动名词(短语)或从句在句子中作宾语时,为保持平衡,避免句式结构的混乱,常用 **it** 作形式宾语,而将真正的宾语放在句尾。此时 **it** 只起引导作用,无意义。

I find **it** interesting to be a tourist guide. (代替不定式)

Our teacher thinks **it** no good learning without practice. (代替动名词短语)

I made **it** clear that I wasn't coming. (代替名词从句)

#### 5. 用于强调句型

为了突出句子中的某一成分,达到强调或使人特别注意该成分的目的,人们常常用“**It** be + 被强调部分+**that** / **who** +其他成分”句式来强调除谓语动词外的大多数句子成分。如果强调的中心成分是人的话,可以用 **that** 或 **who** 来引导,否则用 **that** 引导。

John met Peter in Japan last year. (原句)

**It** was John who/that met Peter in Japan last year. (强调主语)

**It** was Peter whom/that I met in Japan last year. (强调宾语)

**It** was in Japan that I met Peter last year. (强调地点状语)

**It** was last year that I met Peter in Japan. (强调时间状语)

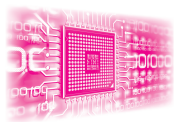
### Task 5 Read and decide 读下面的句子,判断 **it** 的用法。

1. My pen is missing. I can't find it anywhere.
2. It is raining hard.
3. It is a hard job for the police to keep order in an important football match.
4. She found it very difficult to answer the question.

5. It is a pity that you didn't go to see the movie.
6. It was yesterday that I told her the news at the gate.
7. It must be the children.
8. It is dangerous walking on thin ice.
9. The school makes it a rule that those who cheat in the exams will be seriously punished.
10. It was he who met an old friend in the park yesterday.

**Task 6** Choose the best answer 选择正确的答案。

1. It's easier \_\_\_\_\_ than \_\_\_\_\_.  
A. say, do  
B. to say, to do  
C. says, does  
D. saying, doing
2. Children find \_\_\_\_\_ interesting to play computer games.  
A. that  
B. which  
C. it  
D. it's
3. It took the workmen only two hours to finish \_\_\_\_\_ my car.  
A. repairing  
B. repair  
C. to repair  
D. repaired
4. They are good friends. \_\_\_\_\_ is no wonder that they know each other so well.  
A. This  
B. That  
C. There  
D. It
5. Tom's mother kept telling him that he should work harder, but \_\_\_\_\_ didn't help.  
A. he  
B. which  
C. she  
D. it



## Part 6 Read more

### Capacitor

Electrical energy can be stored in an electric field. The device capable of doing this is called a capacitor or a condenser.

A simple condenser consists of two metallic plates separated by a dielectric. If a condenser is connected to a battery, the electrons will flow out of the negative terminal of the battery and accumulate on the condenser plate connected to that side. At the same time the electrons will leave the plate connected to the positive terminal and flow into the battery to make the potential difference just the same as that of the battery. Thus the condenser is said to be charged.

To discharge the condenser the external circuit of these two plates is completed by joining terminals together with a wire. The electrons start moving from one plate to the other through the wire to restore electrical neutrality.

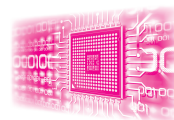
**Task 7** Complete the following statements with a,b, or c, score one mark for each correct answer 选择正确答案，完成如下句子。

1. The device capable of doing this is called a capacitor or a condenser. In this sentence, what does “this” represent? \_\_\_\_\_

- A. capacitor
- B. electrical energy
- C. electrical energy can be stored in an electric field

2. If a condenser is connected to a battery, the electrons will flow out of the negative terminal of the battery and accumulate on the condenser plate connected to \_\_\_\_\_.

- A. the negative terminal
- B. the battery



C. the positive terminal

3. You join the two terminals of a condenser together with a wire

\_\_\_\_\_.

A. When you want to discharge the condenser.

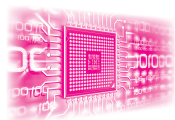
B. When you want to charge the condenser.

C. When you want get a high voltage.



## Part 7 New words & Expression

symbol	['sɪmbəl]	<i>n.</i>	符号; 象征
		<i>v.</i>	用符号代表
restrict	[rɪ'strɪkt]	<i>v.</i>	限制; 限定; 约束
charge	[tʃ 'dʒ]	<i>v.</i>	使充电
		<i>n.</i>	电荷
magnetic	[mæg'netɪk]	<i>a.</i>	有磁性的
		<i>n.</i>	磁; 磁力
field	[fi:ld]	<i>n</i>	场地; 电场
diode	['daɪəʊd]	<i>n</i>	二极管
valve	[vælv]	<i>n.</i>	阀, 真空管
semiconductor	[,semɪkən'daɪktə(r)]	<i>n.</i>	半导体
silicon	['sɪlɪkən]	<i>n.</i>	硅; 硅元素
anode	['ænəʊd]	<i>n.</i>	阳极; 正极
cathode	['kæθəʊd]	<i>n.</i>	阴极; 负极
light-emitting diode			发光二极管
AC			交流电
DC			直流电
Soldering	['sɒldərɪŋ]	<i>n.</i>	锡焊
		<i>v.</i>	焊接
passive	['pæsɪv]	<i>a.</i>	无源的; 被动的
energy	['enədʒi]	<i>n.</i>	能量
coil	[kɔɪl]	<i>n.</i>	线圈
winding	['waɪndɪŋ]	<i>n.</i>	绕组



etch	[etʃ]	<i>v.</i>	侵蚀
package	['pækɪdʒ]	<i>v.</i>	包装; 封装
holder	['həʊldə(r)]	<i>n.</i>	支持物
grid	[grɪd]	<i>n.</i>	栅格
stripboard			带形板
breadboard			面包板
condenser	[kən'densə(r)]	<i>n.</i>	电容器
metallic	[mə'tælɪk]	<i>a.</i>	金属的
dielectric	['daɪr'lektrɪk]	<i>n.</i>	电解质
negative	['negətɪv]	<i>a.</i>	负的
accumulate	[ə'kju:mjəleɪt]	<i>v.</i>	堆积; 积累
positive	['pɒzətɪv]	<i>a.</i>	正的
potential difference			电位差
built-in	[bɪlt ɪn]	<i>a.</i>	嵌入的; 内置的
plug	[plʌg]	<i>v.</i>	插入
folding	['fəʊldɪŋ]	<i>a.</i>	可折叠的
surf	[sɜ:f]	<i>v.</i>	(互联网上)冲浪

# Unit 4

## Battery Charger



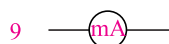
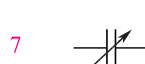
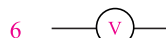
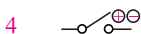
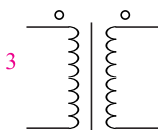
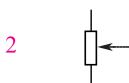
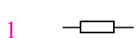
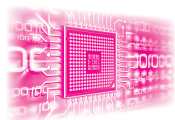
### Part 1 Lead-in

**Task 1** Here are some circuit symbols. Label them and describe their function 匹配电路符号并描述它们的功能。

Example : 3h It's called a transformer. It steps AC voltages up or down.

- a varies capacitance in a circuit
- b rectifies alternating current
- c adds resistance to a circuit
- d measures very small currents
- e breaks a circuit
- f protects a circuit
- g varies the current in a circuit
- h steps AC voltages up or down
- i receives RF signals
- j measures voltage





## Part 2 Dialogue

### Borrow the mobile charger

A : Allen, I need your help.

B : What's wrong?

A : My mobile phone is running out of battery.

B : It's easy, you can recharge it.

A : But I forgot to take the mobile charger. Can I borrow yours?

B : Oh, my god. The battery of my mobile phone is dead, too. I'm using it right now.

A : You know, I have some emergency things to tell my mother. I wonder whether you can lend it to me for several minutes.

B : Ok, here are you.

A : Great! That's very kind of you.

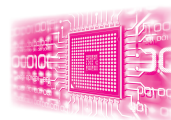
B : You're welcome. Remember to return to me later.

### Everyday English

1. My mobile phone is running out of battery. 我的手机快没电了。

2. But I forgot to take the mobile charger. Can I borrow yours?

但是我忘带充电器了，能把你的借给我吗？



3. The battery of my mobile phone is dead, too.

我的手机电池也没电了。

4. I wonder whether you can lend it to me for several minutes.

我想你能不能借给我几分钟。



## Part 3 Reading

### Battery charge

The power to drive an electronic circuit is normally provided by an AC mains power supply but batteries are often used for portable equipment. Secondary cells can be recharged to their original voltage and can therefore be used many times over.

Recharging is done using a battery charge which consists of a mains power supply with a DC output slightly larger than the required battery EMF. A current is driven through the battery in the opposite direction to its normal output current. The block diagram of a battery charger is shown in Fig.1.

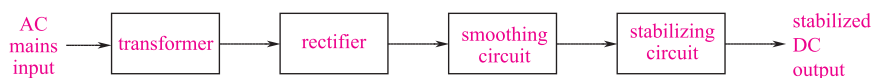


Fig.1 The block diagram of a battery charger

The first stage consists of a transformer which steps down the voltage of the AC mains ( Fig.2 ) .

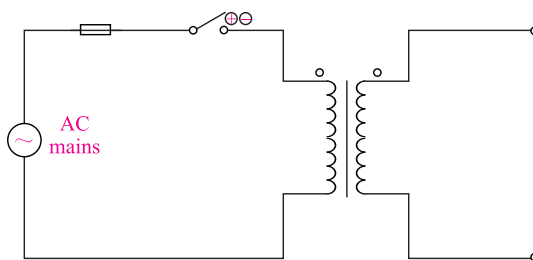
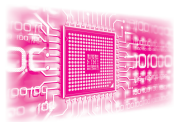


Fig.2 The working principle of transformer

The charger is switched on and off by a switch connected in series with the mains input. A fuse is connected in the live side of the supply to protect the transformer.



The second stage is a bridge rectifier which converts the AC voltage to a DC voltage (Fig.3).

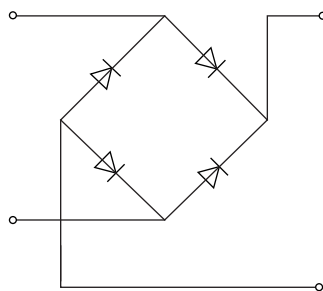


Fig.3 Bridge rectifier circuit diagram

This can be made from discrete components but more usually consists of four diodes contained in one package. It is mounted on an aluminium heatsink to keep the diodes from overheating.

The third stage is a smoothing circuit. It removes the fluctuations in the DC output of the rectifier. It consists of a large electrolytic capacitor connected in parallel with the rectifier as shown in Fig.4.

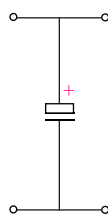


Fig.4 Smoothing circuit

The final stage is a stabilizing circuit consisting of a transistor biased by two resistors and a zener diode. This prevents the output from changing when the load varies. Nicad batteries have such a small internal resistance that the charger must produce a constant current output (Fig.5).

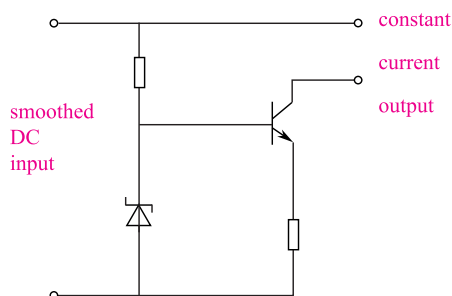
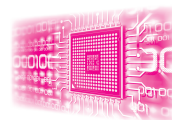


Fig.5 Stabilizing circuit



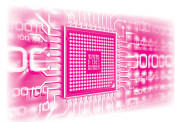
**Task 2** Each of these verbs has a related noun ending in -er or -or which refers to an instrument or component. Complete the column of verbs into nouns 将动词转换成名词。

	Verb	Noun.
Example :	record	recorder
1	oscillate	_____
2	transmit	_____
3	transform	_____
4	charge	_____
5	rectify	_____
6	process	_____
7	amplify	_____
8	collect	_____
9	detect	_____
10	tune	_____

**Task 3** Match each component or unit with its function in a battery charger 将元器件与其作用相互匹配。

Example : The transformer steps down the AC mains voltage.

Component/Unit	Function in a battery charger
1. transformer	a. steps down the AC mains voltage
2. switch	b. prevents the output from changing when the load varies
3. fuse	c. keeps the diodes form overheating
4. rectifier	d. removes the fluctuations in the DC output of the rectifier
5. aluminium heatsink	e. protects the transformer
6. smoothing circuit	f. converts the AC voltage to a DC voltage
7. stabilizing circuit	g. switch the charger on and off



## Part 4 Notes

1. The power to drive an electronic circuit is normally provided by an **AC mains** power supply but batteries are often used for portable equipment.

驱动一个电子电路的电源通常由一个交流电源提供，但对于便携式设备，经常使用的是电池。

句中的 mains 在这里解释为“电源”“电力线”。又如：

The **mains** are the wires which supply electricity to buildings, or the place where the wires end inside the building.

2. A current is driven through the battery in the **opposite** direction **to** its normal output current.

电流经驱动从与电池正常输出电流相反的方向通过电池。

句中的 opposite... to 解释为“在对面”。opposite 当介词的时候不要加 to；opposite 当副词和形容词的时候，后面要加 to。

做介词时：There is a bank **opposite** the supermarket.

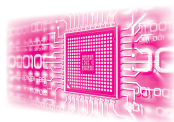
做形容词时：The bank is **opposite to** the supermarket.

3. The second stage is a bridge rectifier **which** converts the AC voltage to a DC voltage (Fig.3).

第二部分是一个桥式整流器。它把交流电压转换成直流电压(图3)。

关系代词 which 一般指物，在定语从句中做主语或宾语，既可以引导限制性定语从句，又可以引导非限制性定语从句。在这里，which 引导了限制性定语从句，用来修饰前面的 bridge rectifier。又如：

A shop should keep a stock of those goods **which** sell best.



This is the family **which** is planning to move to the city.

4. It is mounted on an aluminium heatsink to **keep** the diodes **from** overheating.

它装有一个铝质散热片以避免这些二极管过热。

句中的 keep from 解释为“隐瞒”“使免于”。又如：

I was so excited that I couldn't **keep** the good news **from** her any longer.

我太激动了，再也没法对她隐瞒这个好消息了。

He had to lean on Dan to **keep from** falling.

他不得不靠在丹身上以免摔倒。

5. This **prevents** the output **from** changing when the load varies.

当负载变化时，它能阻止输出变化。

句中的 prevent from 解释为“阻止”“预防某人干某事”。from 为介词，后面应加 ing。又如：

I prevent him from **going** out.

我阻止他出去。



## Part 5 Grammar

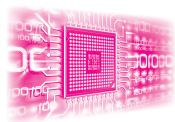
### 动词不定式的用法

1. The power to drive an electronic circuit is normally provided by an AC mains power supply.

2. Cells can be recharged to their original voltage.

3. A current is driven through the battery in the opposite direction to its normal output current.

4. A fuse is connected in the live side of the supply to protect the



transformer.

5. The second stage is a bridge rectifier which converts the AC voltage to a DC voltage.

## 一、概述

动词不定式是由“不定式符号 to+动词原形”构成的一种非谓语动词结构。有些动词不定式不带 to，动词不定式可以作句子的主语、表语、宾语、定语、补语、状语或单独使用。不定式保留动词的某些特性，可以有自己的宾语、状语等，并构成不定式短语。

## 二、用法

### 1. 用作主语

直接把动词不定式置于句首的情况不多，多数情况用 it 作形式主语。动词不定式作主语，谓语动词用第三人称单数形式。

It is our duty to try our best to deal with these problems.

### 2. 用作表语

动词不定式作表语，常说明主语的内容、性质、特征。

The best way is to join an English club.

### 3. 用作宾语

有些动词通常接带 to 的不定式作宾语。

He prefers to drink black coffee.

### 4. 用作定语

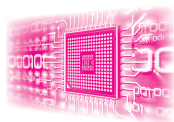
动词不定式与其修饰的词存在动宾关系或动状关系。当不定式为不及物动词时要加入适当的介词。

We have no houses to live in.

He needs time to do homework.

### 5. 用作宾语补足语

感官动词和使役动词后的不定式作宾补须省去 to，变为被动语态时应带 to。



Let me examine you.

They were made to work day and night.

### 6. 用作状语

可表目的、原因、结果等。

She got up early to catch the bus.

### 7. 动词不定式的复合结构

复合结构是“for/of sb. to do sth.”，for/of 引出不定式动作的逻辑主语。介词用 for 还是 of，主要决定于前面形容词的性质。

It is important for me to finish it on time.

It's kind of you to help me.

### 8. 带疑问词的不定式短语

动词不定式前面可以带疑问代词或疑问副词，这种结构起名词的作用，在句子里用作宾语、主语、表语等，或者单独使用。注意：why 后面的不定式不带 to。

Could you please tell me where to park my car?

Why go there?

### 9. 动词不定式的否定式

not/never (to) do...

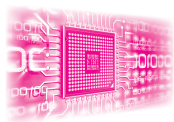
They decide not to talk to each other.

His parents tell him never to play soccer in the street.

## Task 4 Read and match 读下面的句子，完成配对练习。

- |                                      |   |
|--------------------------------------|---|
| 1. The teacher told him              | a. what to do next                            |
| 2. The man will do everything he can | b. not to make so much noise during the class |
| 3. I don't know                      | c. of you to say so                           |
| 4. One needs much practice           | d. to buy a camera for his wife               |
| 5. It is most foolish                | e. to write with                              |





6. I have no pen

f. to learn to speak English well

**Task 5** Choose and complete 用方框中所给的短语完成对话。

to watch	to draw	to see	to do	to take
----------	---------	--------	-------	---------

A : Do you like drawing pictures?

B :Yes, but good pictures are difficult \_\_\_\_ 1 \_\_\_\_ , I prefer taking photos.

If you have a good camera, photos are easy \_\_\_\_ 2 \_\_\_\_.

A : What about outdoor activities? What sports do you play?

B : Well, I go rock climbing most weekends. It is dangerous \_\_\_\_ 3 \_\_\_\_ ,  
so I must be very careful and wear a helmet (头盔).

A : You're very brave. I bet (打赌) you like action films too!

B : Police films are exciting \_\_\_\_ 4 \_\_\_\_ , because there's so much action.  
But I don't really like cartoons. They are boring \_\_\_\_ 5 \_\_\_\_ , and sometimes  
they are stupid.

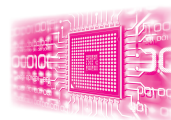


## Part 6 Read more

### Properties of electrical signals

Alternating current (AC) flows one way, then the other way, continually reversing direction. An AC voltage is continually changing between positive (+) and negative (-). The rate of changing direction is called the frequency of the AC and it is measured in hertz (Hz) which is the number of forwards-backwards cycles per second.

Direct current (DC) always flows in the same direction, but it may increase and decrease. A DC voltage is always positive (or always negative), but it may increase and decrease.



An electrical signal is a voltage or current which conveys information, usually it means a voltage. The term can be used for any voltage or current in a circuit.

The voltage-time graph on the Fig.6 shows various properties of an electrical signal. In addition to the properties labeled on the graph, there is frequency which is the number of cycles per second. The diagram shows a sine wave but these properties apply to any signal with a constant shape.

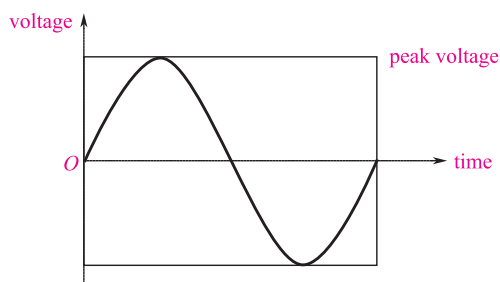


Fig.6 The voltage-time graph

Amplitude is the maximum voltage reached by the signal. It is measured in volts(V). Peak voltage is another name for amplitude.

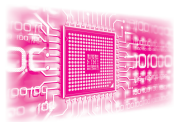
Peak-peak voltage is twice the peak voltage (amplitude). When reading an oscilloscope trace it is usual to measure peak-peak voltage.

Time period is the time taken for the signal to complete one cycle. It is measured in seconds (s), but time periods tend to be short so milliseconds (ms) and microsecond ( $\mu$ s) are often used.

Frequency is the number of cycles per second. It is measured in hertz (Hz), but frequencies tend to be high so kilohertz (kHz) and megahertz (MHz) are often used.

**Task 6** Write T (True) or F (False) beside the following statements about the text 根据文章，判断正误。

1. Direct current (DC) flows one way, then the other way, continually reversing direction. ( )



2. Alternating current (AC) always flows in the same direction. ( )
3. Amplitude is the minimum voltage reached by the signal. ( )
4. Peak-peak voltage is twice the peak voltage (amplitude). ( )

**Task 7** Fill in the missing words according to the text 根据文章补全句子。

1. An AC voltage is continually changing between \_\_\_\_\_ and \_\_\_\_\_.
2. In addition to the properties labeled on the graph, there is frequency which is the number of \_\_\_\_\_ per second.
3. When reading an oscilloscope trace it is usual to measure \_\_\_\_\_ voltage.
4. Peak-peak voltage is \_\_\_\_\_ the peak voltage (amplitude).

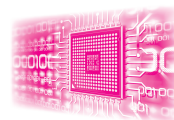
**Task 8** Match the following terms to appropriate definition or expression 将下列术语与其定义相互匹配。

- |                         |  |
|-------------------------|--|
| 1. an electrical signal | a. the time taken for the signal to complete one cycle |
| 2. peak voltage         | b. a voltage or current which conveys information      |
| 3. peak-peak voltage    | c. the maximum voltage reached by the signal           |
| 4. time period          | d. twice the peak voltage (amplitude)                  |

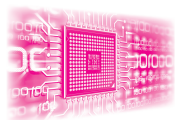


## Part 7 New words & Expression

battery	['bætri]	<i>n.</i>	电池; 蓄电池
equipment	[i'kwɪpmənt]	<i>n.</i>	设备; 装备; 器材
EMF (Electro Motive Force)			电动势
transformer	[træns'fɔ:mə(r)]	<i>n.</i>	变压器



step down			降压
switch	[swɪtʃ]	<i>n.</i>	开关; 转换
		<i>v.</i>	转变; 改变
fuse	[fju:z]	<i>n.</i>	保险丝; 熔断器
		<i>v.</i>	熔化; 融合
live	[lɪv]	<i>n.</i>	火线
rectifier	['rektɪfaɪə]	<i>n.</i>	整流器
bridge rectifier			桥式整流器
discrete	[dɪ'skri:t]	<i>a.</i>	分离的; 分立式
mount	[maʊnt]	<i>v.</i>	安装
aluminium	[ə'lju:minəm]	<i>n.</i>	铝; 铝合金
Heat sink	[hi:t sɪŋk]	<i>n.</i>	吸热装置; 散热片
smoothing	['smu:ðɪŋ]	<i>n.</i>	滤波
		<i>v.</i>	(使)光滑; (使)平坦
fluctuation	[,flʌktʃʊ'eɪʃn]	<i>n.</i>	波动; 涨落
stabilizing	['steɪbəlaɪzɪŋ]	<i>n.</i>	稳定化处理
		<i>v.</i>	(使)稳定
bias	['baɪəs]	<i>v.</i>	加偏压于
zener diode			齐纳二极管
continually	[kən'tɪnjʊəli]	<i>ad.</i>	持续地
reverse	[rɪ'vɜ:s]	<i>v.</i>	(使)反转; (使)颠倒
rate	[reɪt]	<i>n.</i>	速度; 速率
frequency	['fri:kwənsi]	<i>n.</i>	频率
cycle	['saɪkl]	<i>n.</i>	循环; 周期
measure	['meɪʒə(r)]	<i>n.</i>	测量; 测度
		<i>v.</i>	测量; 估量
increase	[ɪn'kri:s]	<i>v.</i>	增加; 增大
decrease	[dɪ'kri:s]	<i>v.</i>	减小; 减少



convey	['kɒnveɪ]	<i>v.</i>	输送; 传导
property	['prɒpəti]	<i>n.</i>	特性; 属性
in addition to		<i>ad.</i>	除.....之外
sine wave			正弦波
constant	['kɒnstənt]	<i>a.</i>	不断的; 永恒的
		<i>n.</i>	常数; 常量
amplitude	['æmplɪtju:d]	<i>n.</i>	振幅; 幅值
peak voltage			峰值电压
peak-peak voltage			峰—峰值电压
oscilloscope	[ə'sɪləskəʊp]	<i>n.</i>	示波器
trace	[treɪs]	<i>v.</i>	跟踪; 追踪
		<i>n.</i>	踪迹; 轨迹
mobile	['məʊbaɪl]	<i>a.</i>	可移动的
emergency	[ɪ'mɜ:dʒənsi]	<i>n.</i>	紧急情况

# Unit 5

## Alarm Systems



### Part 1 Lead-in

**Task 1** Each word in column A often goes before one word from column B. Find the other word pairs 将下列词语配对。

Example : 1f integrated circuit

A		B	
1	integrated	a	supply
2	circuit	b	diode
3	alternating	c	bias
4	zener	d	current
5	remote	e	divider
6	reverse	f	circuit
7	mains	g	control
8	potential	h	diagram

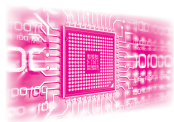


### Part 2 Dialogue

#### Alarm burps

Casher: Thank you, 182 yuan.

Customer: Here you are.



Casher: Here is your change and your receipt.

Customer: Thanks.

Just as the customer leaves, the infrared alarm burps.

Casher: Do you have goods unpaid on you, sir?

Customer: No, I don't think so.

Casher: I'm sorry I need to call the security to have a look.

Customer: There must be a mistake.

Casher: Sorry, sir, it's my job to make sure the goods are paid.

Customer: Wait, can you check this hat? I bought it in the first floor. I think they forgot to demagnetize it.

Casher: Sure. Ah... That's the problem. Have you paid for it?

Customer: Of course I did. Here is the receipt.

Casher: Let me see... Oh, I am awfully sorry, sir.

Customer: That's all right.

## Everyday English

1. Do you have goods unpaid on you, sir?

您身上还有没付款的物品吗?

2. I'm sorry I need to call the security to have a look.

对不起,我得叫保安来看看。

3. It's my job to make sure the goods are paid.

我的职责是保证商品的货款付清。

4. I think they forgot to demagnetize it. 我想他们忘了给它消磁。



## Part 3 Reading

### Alarm system

The three stages of a simple alarm system are shown in Fig.1.

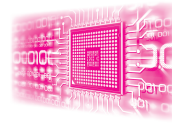


Fig.1 Three stages of a simple alarm system

The first stage is a sensing device that changes its resistance when it detects a particular form of energy. For example, a microphone may be used to detect sound, a thermistor to detect heat, or an LDR (Light-dependent Resistor) to detect light.

The second is an electronic switch. In its simplest form, this could be a single transistor. The transistor switches between cut-off and saturation as the input resistance changes.

The third stage is an output transducer which is switched off and on by the electronic switch. The output transducer could be a buzzer, a light, or a relay which operates a more powerful circuit.

An example of a simple alarm circuit is shown in Fig.2.

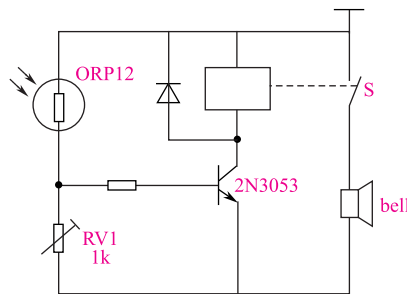
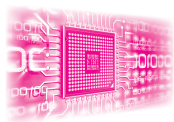


Fig.2 An example of a simple alarm circuit

The LDR forms a potential divider with the variable resistor RV1. When light falls on the LDR, its resistance decreases. This causes the base voltage of the transistor and the bias current to increase. The transistor switches on and there is a rapid rise in the collector current until the transistor goes into saturation. The increased current causes the relay to operate and switch on the output circuit. The sensitivity of the input can be adjusted using RV1.

In a similar way, the relay is de-energized when the light source is removed from the LDR. A large back EMF, which would destroy the transistor, could be generated across the relay. To prevent this, a diode is connected in reverse bias across the relay.





**Task 2** Use information from the text to complete the tables 根据文章中信息完成表格。

Sensing device	Used to detect
LDR	
	Heat
microphone	

**Task 3** Use words from the text to complete the following table 用文中的单词完成表格。

Term	Opposite
cut-off	Saturation
fixed resistor	
increase	
energize	
slow	
forward bias	



## Part 4 Notes

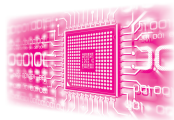
1. The first stage is a sensing device that changes its resistance **when** it detects a particular form of energy.

第一部分是一个灵敏检测设备。当它检测到一种特别能量形式时，它的电阻阻值会发生变化。

句中的 **when** 作为从属连词，引导时间状语从句。又如：

Infra-red signals are sent from the transmitter to the receiver **when** the transmitter is switched on.

当发射机接通时，红外信号从发射机发射到接收器。



2. The transistor switches between cut-off and saturation **as** the input resistance changes.

当输入电阻变化时，该晶体管在截止和饱和之间切换。

句中的 as 作为从属连词引导状语从句。又如：

I met him **as** I was coming home.

我回家时遇见了他。

3. The third stage is an output transducer **which** is switched off and on by the electronic switch.

第三部分是一个输出传感器。通过电子开关，发送器在开和关之间转换。

关系代词 which 引导限定性定语从句，修饰前面的 an output transducer. 又如：

The output transducer could be a buzzer, a light, or a relay **which** operates a more powerful circuit.

输出传感器可以是蜂鸣器、光或者能驱动更大功率电路的继电器。

4. **In a similar way**, the relay is de-energized when the light source is removed from the LDR.

类似地，当光源从光敏电阻上移开时，继电器退去能量。

句中的 in a similar way 解释为“按同样的方式”“类似地”。又如：

We solved the problem in **a similar way**.

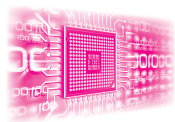
我们用相似的方法解决了那个问题。



## Part 5 Grammar

### 情态动词用法

1. A microphone may be used to detect sound, a thermistor to detect heat, or an LDR (Light-Dependent Resistor) to detect light.



2. In its simplest form, this could be a single transistor.

3. The output transducer could be a buzzer, a light, or a relay which operates a more powerful circuit.

4. The sensitivity of the input can be adjusted using RV1.

### 一、概述

情态动词本身虽有一定的意义，但也同助动词一样，必须和动词一起构成句子的谓语。情态动词没有人称和数的变化（但 have to 除外），后接动词原形。

### 二、用法

#### 1. can, could 的用法

(1) can 表示能力时一般译为“能，会”，即有能力，尤其是生来具备的能力，此时 may 和 must 均不可代替它。

She **can** swim fast, but I can't.

(2) can 常在口语中表示许可。

You **can** use my dictionary.

(3) can 表示推测，意为“可能”，常用于否定句和疑问句中，此时 can't 译为“不可能”。

**Can** the news be true?

No, it **can't** be our teacher. He is on a visit to the Great Wall.

(4) could 是 can 的过去式，意为“能、会”，表示过去的 ability。

He **could** write poems when he was 10.

(5) could 在疑问句中表委婉的语气，此时 could 没有过去式的意思，但回答必须用 can。

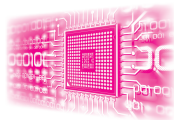
-- **Could** I use your pen?

-- Yes, you **can**.

#### 2. may 的用法

(1) 表示请求、许可，比 can 正式。

You **may** go home now.



(2) 表示推测, 谈论可能性, 意为“可能, 或许”, 一般用于肯定句中。

It **may** rain tomorrow.

(3) may 的过去式为 might, 表示推测, 可能性低于 may。

He is away from school. He **might** be sick.

(4) 表示希望、诉求、祝愿, 常可译为“祝愿”。通常是用 may+主语+动词。

May you have a good time.

### 3. must 的用法

(1) must 表示主观看法, 意为“必须, 一定”。

You **must** stay here until I come back.

(2) 其否定形式 mustn't 表示“一定不要, 千万别, 禁止, 不许”。

You **mustn't** play with fire.

(3) 对 must 引导的疑问句, 肯定回答为 must, 否定回答为 needn't 或 don't have to。

-- **Must** I finish my homework?

-- No, you **needn't**.

(4) must 表示有把握的推测, 用于肯定句。

The light is on, so he **must** be at home now.

### 4. need 的用法

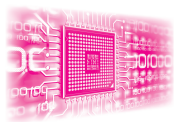
(1) need 表示需要、必须, 主要用于否定句和疑问句中, 其否定形式为 needn't, 意为“没有必要, 不必”。用 need 提问时, 肯定回答为 must, 否定回答为 needn't 或 don't have to。

-- **Need** I stay here any longer?

-- Yes, you must.

-- No, you **needn't**/don't have to.

(2) need 还可以作实义动词, 此时有人称、数和时态的变化, 如果



是人作主语，后面多接动词不定式。如果是物作主语，一般用 need going (具有被动的含义) 或 need to be done，句子的意义不变。

I **need to do** it right now.

The door **needs painting**. = The door **needs to be** painted.

### 5. shall, should 的用法

(1) shall 表示征求对方意见 (多用于第一、三人称)。

**Shall** we go out for a walk?

(2) should 意为“应该”，可表示劝告、建议、义务、责任等。

We **should** protect the environment.

(3) should have done 表示对过去动作的责备、批评。

You **should** have finished your homework.

### 6. will, would 的用法

(1) will 表示意愿、意志、打算，可用于多种人称。

I **will** help you if I'm free this afternoon.

(2) will 用于疑问句中，表示说话人向对方提出请求或建议。

**Will** you tell me the way to the supermarket?

(3) would 表示过去的习惯性动作，有“总是，常常”的意思。

He **would** come to see me when he was in America.

### 7. have to 的用法

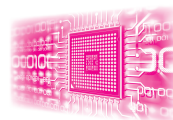
(1) have to 意为“不得不”，着重客观需要，可用于多种时态。

I **haven't** got any money with me, so I 'll have to borrow some from my friend.

(2) have to 与 must 的区别是：must 强调主观看法，have to 侧重于客观上的必要。have to 有时态变化，而 must 没有。

I know I **must** study hard.

My brother was very ill, so I **had to** call the doctor in the mid-night.



**Task 4** Choose and complete 用方框中所给的词完成句子。

can    could    may    must    needn't    shouldn't

1. You \_\_\_\_\_ hand it in at once, you may hand it in tomorrow.
2. \_\_\_\_\_ you tell me what has happened?
3. -- Could I have a word with you, mum?  
-- Oh dear, if you \_\_\_\_\_.
4. We hope that many people \_\_\_\_\_ join us for the picnic tomorrow.
5. My cat is really fat. I \_\_\_\_\_ have given her so much food.
6. You mustn't play with the knife, you \_\_\_\_\_ hurt yourself.

**Task 5** Read and match 读下面的句子，完成配对练习。

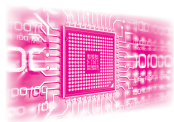
- |   |  |
|---|--|
| 1. Susan and I can go to the lecture                          | a. <b>wouldn't you</b>                           |
| 2. I'm sure you'd rather she went to school<br>by bus         | b. <b>but Charles can't</b>                      |
| 3. Must he come to sign this paper himself                    | c. <b>you needn't have<br/>come this morning</b> |
| 4. As you worked late yesterday                               | d. <b>I hope so</b>                              |
| 5. Will you be able to finish your report today               | e. <b>Yes, he must</b>                           |
| 6. We forgot to bring our tickets, but please<br>let us enter | f. <b>will you</b>                               |



## Part 6 Read more

### A remote control system

The block diagram of a simple remote control system is shown in Fig.3.



When the transmitter is switched on, infra-red signals are sent from the transmitter to the receiver. Pulsed signals are used to prevent interference from any constant infra-red background ‘noise’.

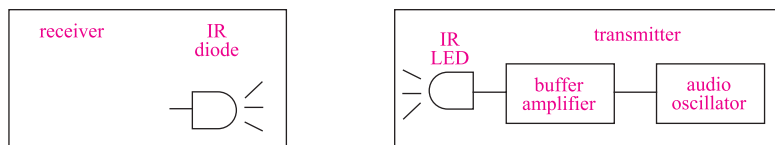


Fig.3 The block diagram of a simple remote control system

To obtain these pulsed signals, electrical pulsed are first generated at a frequency in the upper audio range by the audio oscillator in the transmitter. They are then amplified by the buffer amplifier to enable them to drive the light-emitting diode (LED). Finally, the electrical pulses are converted by the LED into pulsed infra-red radiation which is directed at the receiver. Almost no visible light is emitted from the LED.

The circuit diagram of a remote control transmitter is shown in Fig.4.

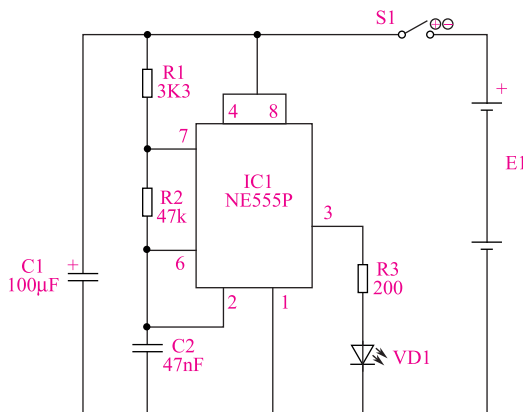
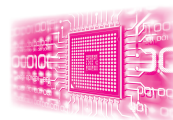


Fig.4 The circuit diagram of a remote control transmitter

In this circuit, both the oscillator and amplifier are combined in a single chip integrated circuit (IC1). The frequency of the oscillator is set by the external timing component R1, R2 and C2. The current output of the amplifier is controlled by the resistor R3 which is connected in series with the LED. Decoupling of the DC supply from the pulsed output of the IC is provided by the electrolytic capacitor C1.



**Task 6** Fill the gaps in this diagram with the help of the text 根据文章完成下表。

Stage	Function
audio oscillator	
	amplifies pulses to drive the LED
	converts pulses into pulsed infra-red radiation

**Task 7** Now fill in the gaps in this diagram with the help of the text 根据文章完成下表。

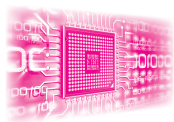
Components	Function
IC1	oscillator and amplifier
R1,R2 and C2	
R3	
C1	



## Part 7 New words & Expression

Sensing	[sensɪŋ]	<i>n.</i>	传感
energy	['enədʒi]	<i>n.</i>	能量; 能源
Microphone	['maɪkrəfəʊn]	<i>n.</i>	麦克风; 话筒
thermistor	[θɜː'mɪstə]	<i>n.</i>	热敏电阻
light-dependent resistor		<i>n.</i>	光敏电阻
cut-off	[kʌt ɔf]	<i>n.</i>	截止
saturation	[,sætʃə'reɪʃn]	<i>n.</i>	(达到) 饱和状态
transducer	[trænz'dju:sə(r)]	<i>n.</i>	传感器; 变频器
buzzer	['bʌzə(r)]	<i>n.</i>	蜂鸣器
relay	['riːleɪ]	<i>n.</i>	继电器
potential divider		<i>n.</i>	电势分配器; 分压器





variable resistor

base [beɪs]

collector [kə'lektə(r)]

sensitivity [ˌsensə'tɪvəti]

adjust [ə'dʒʌst]

reverse bias

transmitter [træns'mɪtə(r)]

infra-red [ˈɪnfrə'red]

receiver [rɪ'si:və(r)]

pulse [pʌls]

interference [ˌɪntə'fɪərəns]

obtain [əb'teɪn]

audio [ˈɔ:diəʊ]

oscillator [ˈɒsɪleɪtə(r)]

buffer [ˈbʌfə(r)]

radiation [ˌreɪdɪ'eɪʃn]

visible [ˈvɪzəbl]

emit [i'mɪt]

remote [rɪ'məʊt]

remote control

external [ɪk'stɜ:nl]

timing [ˈtaɪmɪŋ]

decoupling [dɪ'kʌplɪŋ]

security [sɪ'kjʊərəti]

*n.* 可变电阻

*n.* (晶体管) 基极

*n.* (晶体管) 集电极

*n.* 灵敏度; 敏感度

*v.* 调整; 校正

反向偏置

*n.* 发射机; 发送器

*a.* 红外线的

*n.* 接收机; 接收器

*n.* 脉冲; 脉搏

*v.* 脉冲调节

*n.* 干涉; 干扰

*v.* 获得; 得到

*a.* 听觉的; 音频的

*n.* 音频; 声音回路

*n.* 振荡器

*n.* 缓冲器

*v.* 缓冲

*n.* 辐射; 放射

*a.* 可见的; 看得见的

*v.* 发出; 发射

*a.* 遥远的; 远程的

*n.* 遥控

*a.* 外面的; 外部的

*n.* 计时; 定时

*n.* 退耦 (装置)

*n.* 安保

# Unit 6

## Test and Repair Instruments



### Part 1 Lead-in

**Task 1** Match the types of the instruments to the pictures 将以下工具与图片进行匹配。

analogue multimeter, digital multimeter, oscilloscope, function generator



1. \_\_\_\_\_



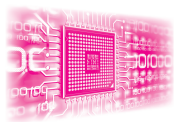
2. \_\_\_\_\_



3. \_\_\_\_\_



4. \_\_\_\_\_



## Part 2 Dialogue

### There is something wrong with my phone

A : Repair service, can I help you?

B : My phone torch didn't work.

A : How old is your phone?

B : About three years.

A : Maybe there is something wrong with the LEDs. Could you bring your phone into our office?

B : Sure, when are you available?

A : From 9 am to 5 pm.

B : Alright, I'll bring it in this afternoon.

A : No problem. See you this afternoon.

### Everyday English

1. My phone torch didn't work. 我的手机手电筒不亮了。

2. How old is your phone? 你的手机用了多长时间了?

3. Maybe there is something wrong with the LEDs.

可能是发光二极管坏了。

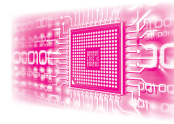
4. When are you available? 你们什么时候营业?



## Part 3 Reading

### Test and repair instruments

Tests and measurements are important in designing, maintaining, troubleshooting, and servicing all types of electrical and electronic products



and circuit systems. The following instruments are commonly used for the test and repair of electronic circuits.

### Multimeter

This instrument can be used to measure a number of different electrical quantities, such as voltage, current, and resistance, i.e. it is a combined voltmeter, ammeter, and ohmmeter. Multimeter are simple, inexpensive, electrical measuring instruments, which almost anyone can learn to use in a few minutes. With them you can troubleshoot appliances, test fuses, measure voltages, check the wires and switches, and so on. Multimeter can have analog or digital displays and can be switched to different measuring range.

### Oscilloscope

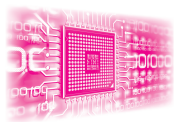
This instrument is used to measure fast-moving signals. It shows how a signal varies with time or relative to another signal. It uses a cathode ray tube to display the waveform of the measured signal on a screen. Now most of the cathode ray tubes used in oscilloscopes have been replaced by LCDs (Liquid Crystal Displays), for LCDs greatly decrease the weight and size of the machine.

### Function generator

This instrument contains a triangular wave oscillator which can be switched to produce triangular, square, or sine waves over a range of frequencies. It is used to test and adjust a variety of electronic equipment such as audio amplifiers. The function generator provides a known signal which can be injected into a circuit. Often it is used with an oscilloscope so that a visual display of the waveform can be seen.

**Task 2** Which of the instruments would you use to do the following operations 进行如下操作时，使用哪种仪器？

1. to check a fuse
2. to determine the frequency response of an audio amplifier
3. to determine the value when the current through a transformer



4. to measure the frequency of an oscillator

**Task 3** Make your choice according to the text 根据文章选择正确答案。

1. It is \_\_\_\_\_ to learn to use a multimeter.  
A . easy                      B . difficult                      C . necessary
2. A multimeter has \_\_\_\_\_ functions.  
A . a few                      B . only one                      C . many
3. A digital multimeter is \_\_\_\_\_ than a analog one.  
A . cheaper                      B . more expensive                      C . more useful
4. Oscilloscopes and multimeters can be used for \_\_\_\_\_.  
A . designing                      B . trouble shooting                      C . testing fuses

**Task 4** Try to match the following columns 中英配对。

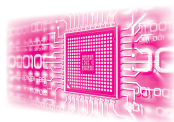
A		B	
1	measuring instrument	a	测量电压
2	trouble shoot appliances	b	测试熔丝
3	decrease the weight	c	测量仪器
4	measure voltages	d	检查开关
5	decrease the size	e	(故障)检修设备
6	check a switch	f	减轻重量
7	test a fuse	g	减少体积



## Part 4 Notes

1. This instrument can **be used to** measure a number of different electrical quantities, such as voltage, current, and resistance, i.e. it is a combined voltmeter, ammeter, and ohmmeter.

这种仪器能用于测量许多不同的电学参量，如电压、电流和电阻，也就是说，它是伏特表、安培表和欧姆表的组合。



句中的 be used to do sth. 解释为“被用来做某事”。又如:

This place has been used to plant vegetables.

这个地方已经用来种蔬菜了。

2. Multimeter are simple, inexpensive, electrical measuring instruments, **which** almost anyone can learn to use in a few minutes.

万用表是一种简单、便宜的电子测量仪器。几乎任何人在几分钟内就能学会使用它。

句中的 **which** 引导非限制性定语从句。又如:

He said he had no money, **which** was not true.

他说他没有钱, 这不是实话。

3. Now most of the cathode ray tubes **used in oscilloscopes** have been replaced by LCDs (Liquid Crystal Displays), for LCDs greatly decrease the weight and size of the machine.

现在大多数示波器中的阴极射线管都由液晶显示器代替, 因为液晶显示器大大减少了示波器的重量和体积。

句中的 **used in oscilloscopes** 为过去分词短语, 作定语, 修饰前面的 the cathode ray tubes。又如:

Some people born and brought up in cities have never seen any crops.

一些生长在城市的人从来没见过庄稼。

4. This instrument contains a triangular wave oscillator **which** can be switched to produce triangular, square, or sine waves over a range of frequencies.

这种仪器装有一个三角波振荡器, 且该振荡器能切换成一定频率范围的三角波、矩形波或正弦波。

句中的 **which** 引导定语从句修饰前面的 a triangular wave oscillator, 又如:

The train **which** has just left is for Shanghai.

刚开走的那列火车是去上海的。



## Part 5 Grammar

### 状语从句

1. Now most of the cathode ray tubes used in oscilloscopes have been replaced by LCDs (Liquid Crystal Displays), for LCDs greatly decrease the weight and size of the machine.

2. Often it is used with an oscilloscope so that a visual display of the waveform can be seen.

#### 一、定义

在复合句中作状语的从句叫做状语从句。它主要用来修饰主句或主句的谓语。一般可分为时间、地点、原因、目的、结果、条件和让步等。尽管种类较多，但由于状语从句与汉语结构和用法相似，所以理解和掌握它并不难。状语从句的关键是要掌握引导不同状语从句的常用连接词。状语从句一般由连词（从属连词）引导，也可以由词组引导。从句位于句首或句中时通常用逗号与主句隔开，位于句尾时可以不逗号隔开。

#### 二、用法

##### 1. 时间状语从句

常用的引导词：when, as, while, as soon as, before, after, since, till, until

While John was reading, his wife was cooking.

Mary started writing when she was 6 years old.

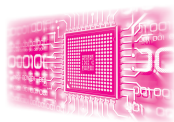
He smiled as he stood up.

He left the classroom after he had finished his homework.

Mr. Smith had worked in a bank for a year before he came here.

We began to work as soon as we got there.





She has taught in that school since she came to China three years ago.

They walked till it was dark.

Xiao Ming didn't leave home until his father came back.

## 2. 地点状语从句

常用的引导词: where

You should have put the book **where** you found it.

## 3. 原因状语从句

常用的引导词: because, since, as, for

I didn't go to school yesterday **because** I was ill.

**Since** everybody is here, let's begin our meeting.

**As** you are in poor health, you should not stay up late.

He must be ill, **for** he is absent today.

## 4. 目的状语从句

常用的引导词: so that, in order that

The boss asked her to hurry up with the letters **so that** he could sign them.

We shall let you know the details **in order that** you can make your arrangements.

## 5. 结果状语从句

常用的引导词: so...that, such...that

He got up **so** early **that** he caught the first bus.

It's **such** a good chance **that** we must not miss it.

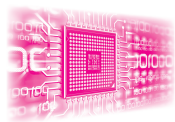
## 6. 条件状语从句

常用的引导词: if, unless

We'll start our work **if** the boss agrees.

I will go to the party **unless** he goes there too.





## 7. 让步状语从句

常用的引导词: though, although

Although he is rich, he isn't happy.

Although we have grown up, our parents treat us as children.

## Task 5 Choose the best answer 选择正确的答案。

1. Mother was worried because little girl was ill, especially \_\_\_\_\_ father was away.

- A. as                      B. that                      C. during                      D. if

2. Why do you want a new job \_\_\_\_\_ you got such a good one already?

- A. that                      B. how                      C. which                      D. when

3. After the war, a new school was put up \_\_\_\_\_ there had once been a shop.

- A. when                      B. where                      C. who                      D. while

4. You will be late \_\_\_\_\_ you leave immediately.

- A. unless                      B. until                      C. if                      D. or

5. -----Why do you drink so much coffee?

-----Well, \_\_\_\_\_ it doesn't keep me awake in the nights, I see no harm in it.

- A. If                      B. unless                      C. although                      D. while

6. I often visited Tian'an Men Square \_\_\_\_\_ I was staying in Beijing.

- A. until                      B. during                      C. while                      D. throughout

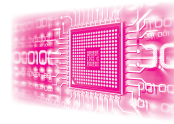
7. Father was \_\_\_\_\_ busy in working \_\_\_\_\_ he often forgot rest or meals.

- A. very, that                      B. so, that                      C. such, as                      D. enough, as

8. We made a decision \_\_\_\_\_ there would be rain, we should stay at home.

- A. that                      B. if                      C. that if                      D. whether

9. Although he was hard-working, \_\_\_\_\_ there wasn't enough money



to pay the bills.

- A. /                      B. and                      C. but                      D. therefor

10. My name is Robert, \_\_\_\_\_ most of my friends call me Bob for short.

- A. then                      B. instead                      C. however                      D. but

**Task 6** Think and complete 根据自己的实际情况完成句子。

1. When I get lost, I \_\_\_\_\_.
2. We have to delay our journey because \_\_\_\_\_.
3. I opened the window so that \_\_\_\_\_.
4. I will go to school tomorrow unless \_\_\_\_\_.
5. Although she is young, she \_\_\_\_\_.



## Part 6 Read More

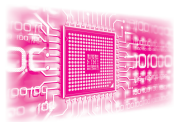
### Multimeters and Its Usage

Multimeters are very useful test instruments. By operating a multi-position switch on the meter they can be quickly and easily set to be a voltmeter, an ammeter or an ohmmeter. They have several settings (called “ranges”) for each type of meter and the choice of AC or DC. Some multimeters have additional features such as transistor testing and ranges for measuring capacitance and frequency.

There are two basic types of multimeters, digital and analog. Analog multimeters have a needle and the digital has a LCD display.

#### Measuring voltage and current with a multimeter.

1. Select a range with a maximum greater than you expect the reading to be.



2. Connect the meter, making sure the leads are the correct way round.  
Digital meters can be safely connected in reverse, but an analog meter may be damaged.
3. If the reading goes off the scale, immediately disconnect and select a higher range.

Multimeters are easily damaged by careless use so please take these precautions:

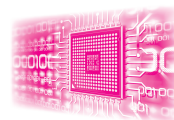
1. Always disconnect the multimeter before adjusting the range switch.
2. Always check the setting of the range switch before you connect to a circuit.
3. Never leave a multimeter set to a current range (except when actually taking a reading). The greatest risk of damage is on the current ranges because the meter has a low resistance.

**Task 7** Write T (True) or F (False) beside the following statements about the text 根据文章判断正误。

1. Analog multimeters have a LED display and the digital has a needle.  
( )
2. An analog meter can be safely connected in reverse, but the digital metres may be damaged.  
( )
3. Connect the meter, making sure the leads are the correct way round.  
( )
4. Always disconnect the multimeter before adjusting the range switch.  
( )

**Task 8** Fill in the missing words according to the text 根据课文内容填空。

1. By operating a multi-position switch on the meter they can be quickly and easily set to be a \_\_\_\_\_, an \_\_\_\_\_ or an \_\_\_\_\_.
2. They have several settings (called “\_\_\_\_\_”) for each type of meter and the choice of \_\_\_\_\_ or \_\_\_\_\_.

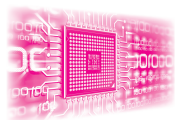


3. Some multimeters have additional features such as \_\_\_\_\_ and ranges for measuring capacitance and \_\_\_\_\_.
4. They are two basic types of multimeters, \_\_\_\_\_ and \_\_\_\_\_.
5. Select a range with a \_\_\_\_\_ than you expect the reading to be.
6. Multimeters are easily damaged by careless use, so please take the \_\_\_\_\_.



## Part 7 New words & Expression

Instrument	['ɪnstɾəmənt]	n.	仪器; 仪表
Maintaining	[meɪn'teɪnɪŋ]	v.	保持; 保养
troubleshooting	['trʌblʃu:tɪŋ]	n.	排错; 检修
multimeter	['mʌltɪmi:tə]	n.	万用表
inexpensive	[,ɪnɪk'spensɪv]	a.	不贵的; 便宜的
appliance	[ə'plaɪəns]	n.	家用电器; 装置
analog	['ænələ:g]	a.	模拟的
digital	['dɪdʒɪtl]	a.	数字的
range	[reɪndʒ]	n.	范围; 量程
relative to			关于...的; 和...比较起来
cathode ray tube=CRT			阴极射线管
liquid crystal	['lɪkwɪd 'krɪstəl]		液晶
function generator			函数(信号)发生器
triangular	[traɪ'æŋgjələ(r)]	a.	三角(形)的
wave	[weɪv]	n.	波; 波动
square	[skweə(r)]	a.	正方形的
a variety of		a.	多种的
equipment	[ɪ'kwɪpmənt]	n.	设备; 装备



inject	[ɪn'dʒekt]	v.	注射
visual	['vɪʒuəl]	a.	视觉的; 看得见的
waveform	['weɪvɔ:m]	n.	波形
usage	['ju:sɪdʒ]	n.	使用; 用法
additional	[ə'dɪfənəl]	a.	额外的; 附加的
needle	['ni:dl]	n.	针; 指针
expect	[ɪk'spekt]	v.	期望; 预期
lead	[li:d]	n.	引线; 表笔
damage	['dæmɪdʒ]	v.	毁坏; 损坏
scale	[skeɪl]	n.	刻度; 规模; 比例
disconnect	[,dɪskə'nekt]	v.	切断; 断开
careless	['keələs]	a.	粗心的
precaution	[prɪ'kɔ:ʃn]	n.	预防, 防备
torch	[tɔ:tʃ]	n.	手电筒
available	[ə'veɪləbl]	a.	有空的; 可找到的

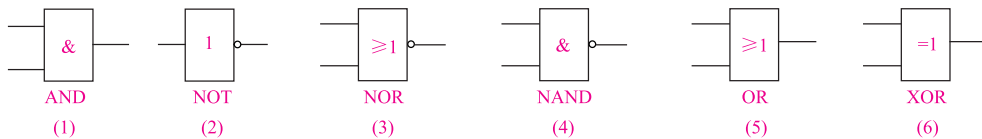
# Unit 7

## Digital Circuit



### Part 1 Lead-in

**Task 1** Match each logic gate with its truth table for each of the following 将真值表和逻辑门电路进行匹配。



A	B	$A+B$
0	0	0
0	1	1
1	0	1
1	1	1

(A)

A	B	$A \cdot B$
0	0	0
0	1	0
1	0	0
1	1	1

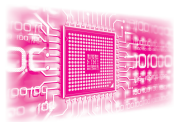
(B)

A	$\overline{A}$
0	1
1	0

(C)

A	B	$\overline{A \cdot B}$
0	0	1
0	1	1
1	0	1
1	1	0

(D)



A	B	$\overline{A+B}$
0	0	1
0	1	0
1	0	0
1	1	0

(E)

A	B	$A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

(F)



## Part 2 Dialogue

### I'd like to buy an MP3 Player

A : Can I help you?

B : I'm looking for an MP3 player. Which brand is of the highest quality?

A : I recommend Pioneer.

B : Which model is the best-seller?

A : This model is very popular with ladies.

B : May I have a look at it?

A : Sure, it's multi-functional. Besides playing music, it can also be used to store documents and make recordings.

B : Do you have this model in white?

A : No, but we have it in yellow.

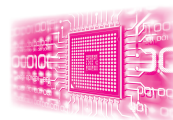
B : Then I'll take the yellow one.

A : Please wait a second. I'll get it for you.

B : OK.

### Everyday English

1. I'm looking for an MP3 player. Which brand is of the highest quality?



我想买个 MP3 播放器。哪个牌子的质量最好？

2. Which model is the best-seller? 哪个型号最热销呢？

3. It's multi-functional. Besides playing music, it can also be used to store documents and make recordings.

它是多功能的。除了播放音乐，还可以用来存储文件和录音。

4. Do you have this model in white? 这个型号有白色的吗？



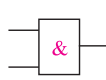
## Part 3 Reading

### Combinational Logic

The decision-making circuits used in modern computers are mainly composed of combinations of digital switching circuits known as logic gates.

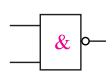
Fig.1 shows the logic symbols and truth tables for some basic gates.

A	B	out
0	0	0
0	1	0
1	0	0
1	1	1



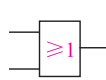
AND

A	B	out
0	0	1
0	1	1
1	0	1
1	1	0



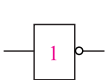
NAND

A	B	out
0	0	0
0	1	1
1	0	1
1	1	1



OR

A	out
0	1
1	0

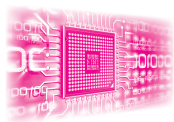


NOT

Fig.1 The logic symbols and truth tables for some basic gates

The output of each gate depends on the combination of its inputs. This is known as combinational logic. The output for all possible inputs is shown using a truth table. The truth tables show that the output of an AND gate is only high (i.e. logic level 1) when all its inputs are high. The output of a NAND gate, however, stays high unless all its inputs are high. The output of a NOT gate (also known as an inverter) is always the opposite of its input.





Computers use ICs which contain a number of logic gates on one chip. An IC pin-out diagram shows the arrangement of the gates and the function of each pin on the chip (Fig.2).

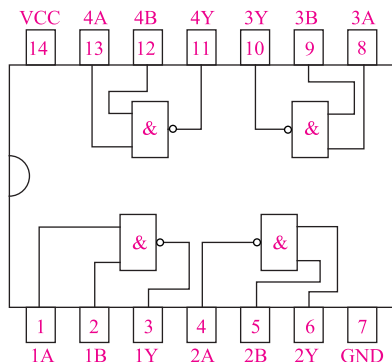


Fig.2 an IC pin-out diagram

The number of ICs used in a computer, i.e. the chip count, can be reduced by connecting NAND gates together to form other types of gates (Fig.3).

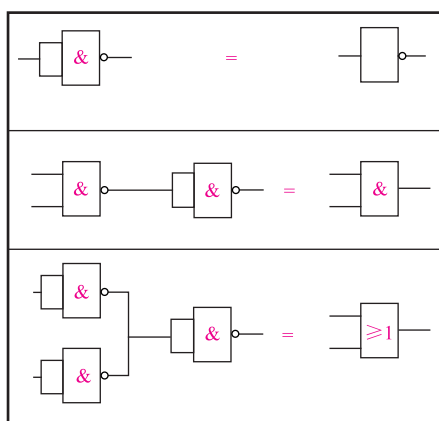
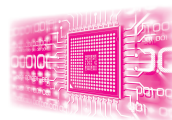


Fig.3 connecting NAND gates together to form other types of gates

**Task 2** Write T (True) or F (False) beside the following statements about the text 根据文章判断正误。

1. **AND** When A is high and B is low, the output is low. ( )
2. **NOT** When A is high, the output is high. ( )
3. **OR** When A and B are high, the output is low. ( )
4. **NAND** When A is high, and B is low, the output is low. ( )



5. **AND**      When A and B are high, the output is high.      (      )  
6. **NOR**      When A and B are low, the output is high.      (      )



## Part 4 Notes

1. The decision-making circuits used in modern computers **are** mainly **composed of** combinations of digital switching circuits known as logic gates.

用于现代计算机的判断电路主要由称为逻辑门的数字开关电路组成。

句中的 be composed of 解释为“由……组成”。又如:

All matter is found to **be composed of** atoms and molecules.

(人们)发现所有物质都是由原子或分子构成的。

2. The output of each gate **depends on** the combination of its inputs.

每个门的输出取决于其输入的组合。

句中的 depend on 解释为“依赖, 取决于”。又如:

Children **depend on** their parents for food and clothing.

小孩依赖他们的父母供给衣食。

3. This **is known as** combinational logic.

这叫做组合逻辑。

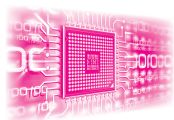
句中的 be known as 解释为“被称为”“被认为”。又如:

Florida can **be known as** energy and green industry leaders throughout the world.

佛罗里达可以作为一个全球的能源和绿色行业领袖而闻名。

4. The output of a NOT gate (also known as an inverter) is always **the opposite of** its input.

一个“非”门(也称为反相器)的输出总是与其输入相反。



句中的 the opposite of 解释为“相反的”。又如:

Black is **the opposite of** white.

黑是白的对立面。



## Part 5 Grammar

### 分词的用法

1. The decision-making circuits used in modern computers are mainly composed of combinations of digital switching circuits known as logic gates.
2. The output for all possible inputs is shown using a truth table.
3. The chip count, can be reduced by connecting NAND gates together to form other types of gates

#### 一、定义

分词包括现在分词和过去分词。它保留着动词的若干特征,又具有形容词、副词的特征。分词有时态和语态变化,又带有宾语并能被状语修饰。分词在句中主要作定语、状语用,作表语也十分普遍

#### 二、分词的时态和语态

##### 1. 现在分词

现在分词有一般时和完成时,且有主动语态和被动语态。

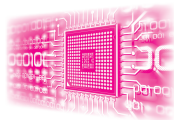
一般时为 doing, 被动语态为 being done。表示和谓语动词所表示的动作同时发生的行为, 被动语态表示句子的主语是分词动作的承受者。

完成时为 having done, 被动语态为 having been done。表示在谓语动词所表示的动作之前发生的行为, 被动语态表示句子的主语是分词动作的承受者。

Being a student, he was interested in books. (一般时主动态)

Having studied in the university for 3 years, he knows the way very





well. (完成时主动态)

The question being discussed is important. (一般时被动态)

Having been criticized by the teacher, Li Ming gave up smoking. (完成时被动态)

## 2. 过去分词

过去分词表示在谓语动词之前发生的动作，本身有被动的含义，所以只有一般时没有完成时。

I have a radio made in China.

## 三、分词的用法

分词在句中可作定语、表语、宾语补足语、状语等。

### 1. 作定语

分词作定语有两种形式。它可以放在被修饰的名词之前，称为前置定语。有的放在被修饰的名词之后，称为后置定语。

Make less noise. There's a sleeping child. (现在分词作前置定语)

The bridge built last month needs repairing. (现在分词作后置定语)

The excited people rushed into the building. (过去分词作前置定语)

All the windows broken have been repaired. (过去分词作后置定语)

### 2. 作表语

分词作表语表示主语的某种性质或状态。

The news sounds encouraging. (现在分词作表语)

They got very excited. (过去分词作表语)

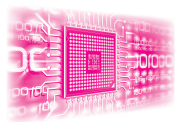
### 3. 作宾语补足语

He soon had them all laughing. (现在分词作宾补)

I find some students in this school often punished by the teachers. (过去分词作宾补)

### 4. 作状语

分词在句中作状语，表示各种不同的内容，可以表时间、原因、让



步、结果、方式、条件等。

Arriving in Paris, I lost my way. (现在分词作时间状语)

Being very weak, she couldn't move. (现在分词作原因状语)

Given more time, we could have done it better. (过去分词作条件状语)

The teacher stood there surrounded by the students. (过去分词作方式状语)

Although living miles away, he attended the course. (现在分词作让步状语)

They sang and laughed, they came into the classroom. (过去分词作伴随状语)

The fire lasted nearly a month, leaving nothing valuable. (现在分词作结果状语)

### 5. 分词的独立主格结构

分词短语作状语时，其逻辑主语就是句子的主语，否则，就必须在分词前另外加上自己的逻辑主语（名词或主格代词）的这个结构叫做独立主格结构或分词的复合结构。

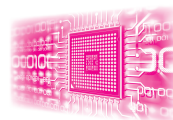
Supper finished, we started to discuss the picnic.

The river looks more beautiful, flowers and grass growing on both sides.

Talking of the computer, I like it very much.

### Task 3 Read and complete 阅读下列句子并用动词的正确分词形式完成句子。

1. He told me about the things \_\_\_\_\_ (discuss) at the meeting .
2. The plane crashed, \_\_\_\_\_ (kill) all 200 people.
3. We solve the problem by reducing our costs and \_\_\_\_\_ (borrow) money.
4. When I got there, I found the farm tools \_\_\_\_\_ (repair).



5. She caught the student \_\_\_\_\_ (cheat) in exams.
6. Just then he heard someone \_\_\_\_\_ (call) for help.
7. he worked so hard that he got his pay \_\_\_\_\_ (raise).
8. People in the south have their houses \_\_\_\_\_ (make of) bamboo.
9. The missing boys were last seen \_\_\_\_\_ (play) near the river.
10. \_\_\_\_\_ (see) the house on fire, he dialed 119.

#### Task 4 Choose the best answer 选择正确的答案。

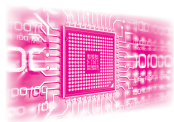
1. \_\_\_\_\_ a post office, I stopped \_\_\_\_\_ some stamps.  
A. Passed, buying                      B. Passing, to buy  
C. Having passed, buy                D. Pass, to buy
2. Here are some new computer programs \_\_\_\_\_ for home buildings.  
A. designing                              B. design  
C. designed                                D. to design
3. The teacher came into the classroom \_\_\_\_\_ by his students.  
A. followed                                B. following  
C. to be following                        D. having followed
4. \_\_\_\_\_ how to do the homework, I went to ask my teacher for help.  
A. Not to know                            B. Not known  
C. Knowing not                            D. Not knowing
5. \_\_\_\_\_ many times, he still couldn't understand.  
A. Having been told                      B. Having told  
C. He having been told                  D. telling



## Part 6 Read more

### Digital Circuit

Digital signals and circuits are the vast and important subject. Digital

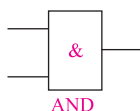


signals are binary in nature taking on values in one of two well-defined ranges: 0 or 1.

Digital systems are said to be constructed by using logic gates. These gates are the AND, OR, NOT, NAND, NOR, and XOR gates. Truth tables are used to help show the function of a logic gate.

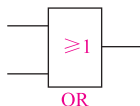
The basic operations are described below with the aid of truth tables. These logical gates are listed as follow.

### 1. AND gate



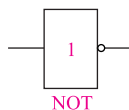
The AND gate is an electronic circuit that gives a high output (logic '1') only if all its inputs are high.

### 2. OR gate



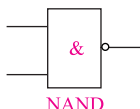
The OR gate is an electronic circuit that gives a high output (1) if one or more of its inputs are high.

### 3. NOT gate

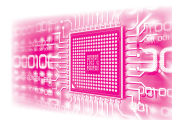


The NOT gate is an electronic circuit that produces an inverted version of the input at its output. It is also known as an inverter.

### 4. NAND gate

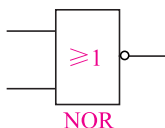


This is a NOT-AND gate which is equal to an AND gate followed by a NOT gate. The outputs of all NAND gates are high if any of the inputs are low. The symbol is an AND gate with a small circle on the output. The small



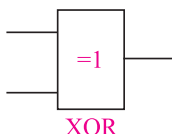
circle represents inversion.

### 5. NOR gate



This is a NOT-OR gate which is equal to an OR gate followed by a NOT gate. The outputs of all NOR gates are low if any of the inputs are high. The symbol is an OR gate with a small circle on the output. The small circle represents inversion.

### 6. XOR gate



The 'Exclusive-OR' gate is a circuit which will give a high output if either, but not both, of its two inputs are high.

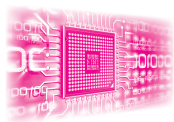
### Task 5 Try to match the following columns 中英配对。

- |                    |         |
|--------------------|---------|
| 1. logic gate      | a. 真值表  |
| 2. digital circuit | b. 异或门  |
| 3. truth table     | c. 数字电路 |
| 4. invert          | d. 逻辑门  |
| 5. and operation   | e. 反相器  |
| 6. XOR gate        | f. 与运算  |

### Task 6 Combine the half statement in the number order with those in the alphabetic order 配对完成如下语句。

1. Digital signals and circuit are
2. A circuit that performs the AND operation
3. Digital signals are binary in nature
4. The AND operation





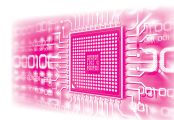
## 5. The OR operation

- a. is called an AND gate.
- b. the vast and important subject.
- c. is a form of multiplication, with these manipulation rules:  $0 \cdot 0 = 0$ ,  $0 \cdot 1 = 0$ ,  $1 \cdot 0 = 0$ ,  $1 \cdot 1 = 1$ .
- d. performed according to these rules:  $0 + 0 = 0$ ,  $0 + 1 = 1$ ,  $1 + 0 = 1$ ,  $1 + 1 = 1$ .
- e. taking on values in one of two well-defined ranges.



## Part 7 New words & Expression

combinational	[,kɒmbɪ'neɪʃənəl]	a.	组合的
logic	['lɒdʒɪk]	n.	逻辑; 逻辑学
decision-making circuit			判断电路
truth table			真值表
gate	[geɪt]	n.	门电路
AND gate			与门
OR gate			或门
NOT gate			非门
NAND gate			与非门
NOR gate			或非门
XOR gate			异或门
inverter	[ɪn'vɜ:tə]	n.	反相器; 逆变器
pin-out diagram			引脚图
arrangement	[ə'reɪndʒmənt]	n.	排列; 安排
count	[kaʊnt]	n.	总数
		v.	计数
vast	[v :st]	a.	广阔的; 巨大的
binary	['baɪnəri]	a.	二值的;



in nature

value

define

construct

describe

represent

exclusive

brand

recommend

document

['vælju:]

[dɪ'faɪn]

[kən'strʌkt]

[dɪ'skraɪb]

[ˌreprɪ'zent]

[ɪk'skluːsɪv]

[brænd]

[ˌrekə'mend]

['dɒkjumənt]

*n.* 二进制  
实际上; 性质上

*n.* 值; 价值

*v.* 下定义

*v.* 构成

*v.* 描述; 形容

*v.* 象征; 代表

*a.* 专用的; 排外的

*n.* 商标; 牌子

*v.* 推荐

*n.* 文档

# Unit 8

## Computer



### Part 1 Lead-in

**Task 1** The following pictures are kinds of hardware. Do you know their English names 识别下列仪器。



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



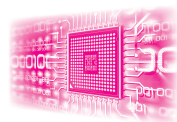
4. \_\_\_\_\_



5. \_\_\_\_\_



6. \_\_\_\_\_



## Part 2 Dialogue

### Buying a computer

A : Welcome to our Computer City! Can I help you?

B : I just have a look. If ok, I will buy a computer.

A : Well. There are many kinds of computers here. Which kind do you like better, a laptop or a desktop?

B : A laptop. Because it is very convenient.

A : Ok. How about this one? As far as I'm concerned, Windows 7 should be highly recommended to you. It's very fast and it also has large memory. You can study, play games, write articles, chat on internet and so on. And it is also very beautiful. You just need 5000 yuan to carry it home.

B : May I have a discount?

A : That's the cheapest price that I can sell it to you. Will you buy it now? If so I'll pack it up for you.

B : Well. Thank you. I'm sorry that I want to see somewhere else. Maybe I will come back later.

A : You're welcome.

### Everyday English

1. Which kind do you like better, a laptop or a desktop?

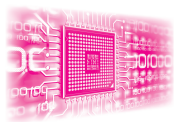
便捷式和桌面式的电脑，你更喜欢哪一种？

2. As far as I'm concerned, Windows 7 should be highly recommended to you. It's very fast and it also has large memory.

我为你大力推荐 Windows 7 系统，它非常快同时内存也很大。

3. Will you buy it now? If so I'll pack it up for you.

你现在要买吗？如果要买我就帮你包装好。



4. I'm sorry that I want to see somewhere else. Maybe I will come back later. 抱歉, 我还想去别的地方看看, 也许我还会回来的。



## Part 3 Reading

### Microcomputer systems

The block diagram of a microcomputer system is shown in Fig.1.

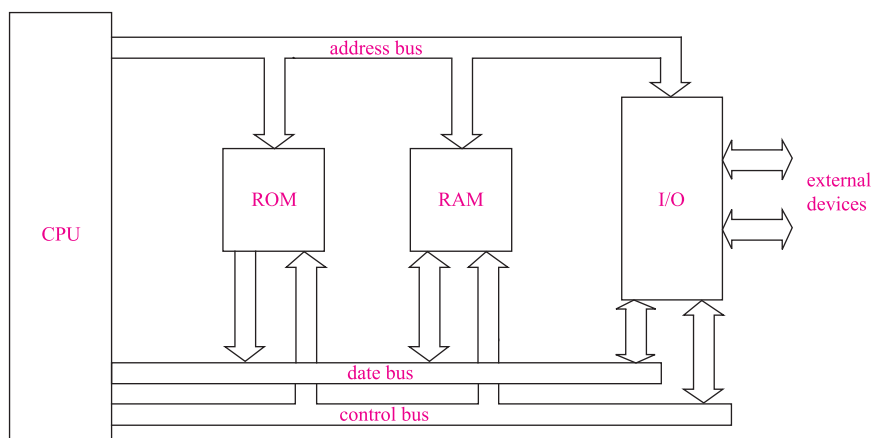


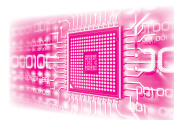
Fig.1 The block diagram of a microcomputer system

The I/O (Input/Output) unit consists of one or more ICs, which are used to control the data going in and out of the computer.

The ROM (Read-Only Memory) and RAM(Random-Access Memory) units consist of a number of special digital logic chips which can store programs and data. The small ROM provides some permanent storage and the RAM is used for temporary storage. Unlike the ROM, the contents of the RAM is constantly changing, but it only operates while the computer is switched on.

The CPU(Central Processing Unit) is a microprocessor. It is the main part of the computer, which controls the rest of the system and performs all the arithmetic and logic operations on the data.

Sets of connectors known as buses are used to carry the internal signals between each unit. The data bus is used to transfer data between all the units. The control bus is used to send control signals from the CPU to the other



units. The address bus is used to send signals from the CPU which indicate the memory and I/O locations to be used.

**Task 2** Can you write the full form of these abbreviations  
写出下列缩写的完整形式。

1. RAM      2. ROM      3. CPU      4. I/O

**Task 3** Try to match the following columns 英英配对。

- | A             | B   |
|---------------|---|
| 1 I/O unit    | a temporary storage   |
| 2 ROM         | b sends signals from the CPU which indicate the memory and I/O locations to be used |
| 3 RAM         | c controls data going in and out of the computer                                    |
| 4 CPU         | d transfers data between each unit  |
| 5 Data bus    | e permanent storage   |
| 6 Control bus | f sends control signals from the CPU to the other units                             |
| 7 Address bus | g controls the system, performs all arithmetic and logic operations on the data     |



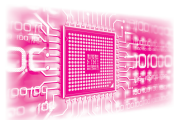
## Part 4 Notes

1. The I/O (input/output) unit **consists of** one or more ICs, which are used to control the data going in and out of the computer.

输入/输出单元 (I/O) 由一个或多个集成电路构成，它们控制计算机的进和出。

(1) 句中的 consist of 解释为“由.....组成”，说明组成某一事物的部分。又如：

All electronic computers **consist of** five units although they are of different kinds.



计算机虽然种类不同，但它们都是由五个部件组成的。

(2) 句子中 which 引导了非限制性定语从句，修饰先行词 ICs。又如：

Beijing, **which** is the capital of China, is a very beautiful city.

北京，中国首都，是一个非常美丽的城市。

2. Unlike the ROM, the contents of the RAM is constantly changing, but it only operates **while** the computer is switched on.

不像 ROM，RAM 的内容是不断改变的，但是只有当计算机接通电源时，它才工作。

句中的 while 解释为“当……的时候”。又如：

**While** I was watch TV, the bell rang.

我看电视时，铃响了。

3. It is the main part of the computer, which controls **the rest of** the system and performs all the arithmetic and logic operations on the data.

它是计算机的主要部分，它控制系统的其余部分，并且对数据进行所有的算术和逻辑运算。

句中的 the rest of 解释为“剩下的，其余的”，一般指的是剩余部分的所有内容。在这里是指 CPU 控制着系统（除 CPU 本身以外）的所有部件。又如：

The chairman went home, but **the rest of** the director stayed in the boardroom.

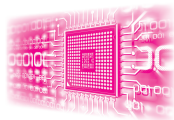
董事长回家了，而其余的董事留在董事会会议室里。



## Part 5 Grammar

### 定语从句

1. The I/O (Input/Output) unit consists of one or more ICs, which are used to control the data going in and out of the computer.



2. The ROM (Read-Only Memory) and RAM(Random-Access Memory) units consist of a number of special digital logic chips which can store programs and data.

3. It is the main part of the computer, which controls the rest of the system and performs all the arithmetic and logic operations on the data.

4. The address bus is used to send signals from the CPU which indicate the memory and I/O locations to be used.

## 一、定义

定语是用来限定、修饰名词或代词的，汉语中常用“……的”表示。主要由形容词担任，也可以由一个句子来担任。单词作定语时通常放在它所修饰的词之前，作前置定语。短语和从句作定语时则放在所修饰的词之后，作后置定语。

定语从句是指在复合句中，修饰某一名词或代词的从句，定语从句要放在修饰的词后面。

如：The **man** who lives next to us is a policeman.

句中的 **man** 是定语从句所修饰的词，叫先行词，定语从句放在先行词的后面。引导定语从句的词有关系代词 **that**, **which**, **who** (宾格 **whom** 的所有格 **whose**) 和关系副词 **where**, **when**, **why**

关系词常有 3 个作用：① 引导定语从句；② 代替先行词；③ 在定语从句中担当一个成分。

## 二、关系代词引导的定语从句

### 1. who

**who** 指人，在从句中做主语。

The boys **who** are playing football are from Class One.

### 2. whom

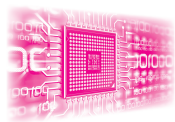
**whom** 指人，在定语从句中充当宾语，常可省略。

Mr. Liu is the person **whom** you talked about.

### 3. Which

**Which** 指物，在定语从句中做主语或宾语，做宾语时可省略。





Football is a game **which** is liked by most boys. ( **which** 在从句中做主语 )

This is the pen (**which**) he bought yesterday. ( **which** 在从句中做宾语 )

#### 4. that

**that** 指人时, 相当于 **who** 或者 **whom**; 指物时, 相当于 **which**。在定语从句

中做主语或者宾语, 做宾语时可省略。

The people **that**/who come to visit the city are all here. ( 在从句中做主语 )

Where is the man **that**/whom I saw this morning? ( 在从句中做宾语 )

#### 5. whose

**whose** 通常指人, 也可指物, 在定语从句中做定语。

He has a friend **whose** father is a doctor.

I lived in a house **whose** roof has fallen in.

**whose** 指物时, 常用以下结构来代替。

The classroom **whose** door is broken will soon be repaired.

=The classroom the door of which is broken will soon be repaired.

#### 6. 只用 **that** 不用 **which** 的情况

(1) 先行词是 **all**, **few**, **little**, **nothing**, **everything**, **anything** 等不定代词时。

**All** that he said is true.

(2) 先行词被 **only**, **no**, **any**, **all** 等词修饰时。

He is the **only** foreigner that has been to that place.

(3) 先行词是序数词或被序数词修饰的词。

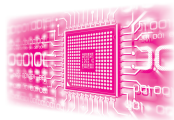
He was the **second** (person) that told me the secret.

(4) 先行词是形容词最高级或被形容词最高级修饰的词。

This is the **best book** (that) I have read this year.

(5) 先行词既包括人又包括物时。

He talked about the **people and the things** (that) he remembered.



### 7. 只用 which 不用 that 的情况

(1) 非限制性定语从句不能用关系代词 that, 作宾语用的关系代词不能省略。

The boy, who is good at soccer, comes from Xinjiang.

That necklace, which you gave me as a present, was lost yesterday.

(2) 非限制性定语从句的作用是对所修饰的成分作进一步说明, 通常是引导词和先行词之间用逗号隔开, 将从句去掉后其他部分仍可成立。

Charles Smith, who was my former teacher, retired last year. (非限制性定语从句)

There is somebody here who wants to speak to you. (限制性定语从句)

(3) which 可以引导从句修饰前面的整个主句, 代替主句所表示的全部概念或部分概念。在这种从句中, which 可以作主语, 也可以作宾语或表语, 多数情况下意思与 and this 相似, 并可以指人。

He did very well in the competition, which made his parents very happy.

(4) 如果作先行词的集体名词着眼于集体的整体, 关系代词用 which; 若是指集体中的各个成员, 则用 who。

### 三、关系副词引导的定语从句

关系副词在句中作状语, 相当于“介词+关系代词”。

#### 1. when = in / during / on... which

指时间, 在定语从句中作状语。

I still remember the day **when** I first came to the school.

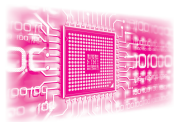
=I still remember the day **on which** I first came to the school.

#### 2. where = in / at / on... which

指地点, 在定语从句中作地点状语。

This is the house **where** we lived last year.

=This is the house **in which** we lived last year.



### 3. why = for which

指原因，在定语从句中作原因状语。

Please tell me the reason **why** you missed the plane.

=Please tell me the reason **for which** you missed the plane.

## 四、“介词+关系代词”结构

“介词+关系代词”可引导限制性定语从句，也可引导非限制性定语从句。其中介词可以是 in, on, about, from, for, with, to, at, of, without 等，关系代词只能用 whom 或 which，不能用 that。

Is that the house in which you live?

关系代词 whom, which 在定语从句中作介词宾语时，可以和介词一起放在先行词与定语从句之间，有时为了关系紧凑也可以让 whom 或 which 和先行词紧挨着，而将介词置于定语从句的后面。

That was the room in which we had lived for ten years.

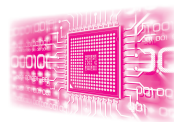
=That was the room which we had lived in for ten years.

像 **listen to**, **look at**, **take care of** 等固定短语，在定语从句中一般不宜将介词与动词分开。

This is the boy whom she has taken care of.

## Task 4 Read and underline 阅读下列句子并标出定语从句和先行词。

1. Another thing that I found very difficult was English test.
2. The book which is on the table is mine.
3. They said something you didn't like.
4. You couldn't understand people who talked fast.
5. The woman whom you saw is our English teacher.
6. The boy whose father is a teacher is good at English.
7. Can you think of any problems you have had recently?
8. My friends and I talked about the rules that we have in school.
9. The man whom I met yesterday lent me some money.



10. If you know anyone else who collects them, please tell me.

**Task 5** Choose and complete 用方框中所给的词完成句子。

who	whom	whose	which	that
-----	------	-------	-------	------

1. The runner \_\_\_\_\_ you are asking about is over there.
2. We depend on the land from \_\_\_\_\_ we get our food.
3. A clock is a machine \_\_\_\_\_ tells people the time.
4. Show me the boy \_\_\_\_\_ mother is a well-known singer.
5. I will never forget the people and the places \_\_\_\_\_ I have ever visited.
6. Is there anyone \_\_\_\_\_ family is in Beijing?
7. The man \_\_\_\_\_ was passing by saw what happened.
8. The tree, \_\_\_\_\_ is four hundred years old, is very famous here.
9. The student \_\_\_\_\_ answered the question is Zhang Hua.
10. The film \_\_\_\_\_ they are talking about is very interesting.

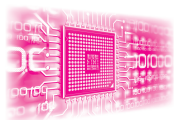


## Part 6 Read more

### Computer

The computer has a well-known graceful name——electrical brain, for the working process of a computer is similar to a human brain very much. A computer consists of two parts: hardware and software.

Hardware usually refers to the parts that you can see and touch, such as main frame, keyboard, monitor and mouse, etc. If you open the case of your computer, you'll surely see the main internal components: the main board, CPU (Central Processing Unit), hard disk, memory, chipset, power and output port. The main input devices are the keyboard, mouse and scanner,



while the output devices are the monitor and printer.



Desktop computer



Notebook computer

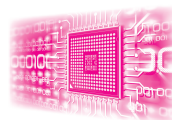
And software is the information and instructions. Generally, software is another name for computer program. Without software, it is impossible for computers to work. So it is as important as hardware. Software can be classified into two types: system software and application software. Here are some popular software: DOS (Disk Operation System), Windows operation system, WPS (Word Processing System) and Protel, etc.

### Task 6 Try to match the following columns 英英配对。

- | A          | B                             |
|------------|-------------------------------|
| 1 computer | a hardware                    |
| 2 mouse    | b display screen              |
| 3 program  | c the heart of a computer     |
| 4 CPU      | d a unit to store information |
| 5 memory   | e electrical brain            |
| 6 monitor  | f software                    |

### Task 7 Make your choice according to the text 根据文章选择正确答案。

- We usually call a computer \_\_\_\_\_.  
 A. a machine      B. a device      C. an electrical brain
- \_\_\_\_\_ is one of hardwares of a computer.  
 A. WPS      B. DOS      C. CPU

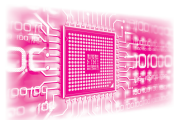


3. \_\_\_\_\_ is something that can be seen and touched.  
A. Monitor                      B. DOS                      C. Protel
4. Software is sometimes called \_\_\_\_\_.  
A. program                      B. system                      C. information
5. A keyboard is a requisite( 不可少的 ) \_\_\_\_\_ device of a computer.  
A. software                      B. output                      C. hardware



## Part 7 New words & Expression

ROM			只读存储器
RAM			随机存取存储器
random	['rændəm]	a.	随机的; 任意的
access	['ækses]	v.	存取
permanent	['pɜ:mənənt]	a.	永久性的
storage	['stɔ:ridʒ]	n.	储存
temporary	['tempərɪ]	a.	临时的
content	['kɒntent]	n.	内容
CPU			中央处理器
microprocessor	[,maɪkrəʊ'prəʊsesə(r)]	n.	微处理器
perform	[pə'fɔ:m]	v.	执行
arithmetic	[ə'riθmətɪk]	n.	算数; 计算
bus	[bʌs]	n.	总线
transfer	[træns'fɜ:(r)]	v.	转移; 传递
graceful	['greɪsfl]	a.	优美的; 优雅的
hardware	['h :dweə(r)]	n.	计算机硬件
software	['sɒftweə(r)]	n.	计算机软件
frame	[freɪm]	n.	框架
keyboard	['ki:bɔ:d]	n.	键盘
monitor	['mɒnɪtə(r)]	n.	监视器; 显示器



mouse	[maʊs]	<i>n.</i>	鼠标
case	[keɪs]	<i>n.</i>	容器（箱，盒）
main board			计算机主板
hard disk			硬盘
chipset	['tʃɪpset]	<i>n.</i>	芯片组
scanner	['skænə(r)]	<i>n.</i>	扫描设备
printer	['prɪntə(r)]	<i>n.</i>	打印机
instruction	[ɪn'strʌkʃn]	<i>n.</i>	指令
program	['prəʊgræm]	<i>n.</i>	程序
classify	['klæsɪfaɪ]	<i>v.</i>	分类
system software			系统软件
application			应用软件
software			
Disk Operation			
System			磁盘操作系统
laptop	['læptɒp]	<i>n.</i>	便携式电脑
convenient	[kən'veɪniənt]	<i>a.</i>	方便的



# Appendix A

## Vocabulary

### A

a variety of

AC

access

accumulate

additional

adjust

aerial

AF amp

aluminium

amplifier

amplify

amplitude

analog

AND gate

anode

appliance

application software

approach to

arithmetic

arrangement

audio

['ækses]

[ə'kju:mjəleɪt]

[ə'dɪʃənəl]

[ə'dʒʌst]

['eəriəl]

[ə'ljʊ:miːnəm]

['æmplɪfaɪə(r)]

['æmplɪfaɪ]

['æmplɪtju:d]

['ænələ:g]

['ænəʊd]

[ə'plaɪəns]

[ə'rɪθmətɪk]

[ə'reɪndʒmənt]

['ɔ:diəʊ]

*a.* 多种的

交流电

*v.* 存取

*v.* 堆积; 积累

*a.* 额外的; 附加的

*v.* 调整; 校正

*n.* [电讯] 天线

音频放大器

*n.* 铝; 铝合金

*n.* 放大器

*v.* 放大

*n.* 振幅; 幅值

*a.* 模拟的

与门

*n.* 阳极; 正极

*n.* 家用电器; 装置

应用软件

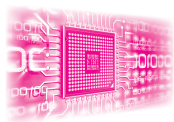
接近

*n.* 算数; 计算

*n.* 排列; 安排

*a.* 听觉的; 音频的;





automatic [ɔ:tə'mætrɪk]  
available [ə'veɪləbl]

*n.* 音频; 声音回路  
*a.* 自动的; 自动化的  
*a.* 有空的; 可找到的

## B

base [beɪs]  
battery ['bætri]  
bias ['baɪəs]  
binary ['baɪnəri]

*n.* (晶体管) 基极  
*n.* 电池; 蓄电池  
*v.* 加偏压于  
*a.* 二态的;  
*n.* 二进制

brand [brænd]  
breadboard  
bridge rectifier  
buffer ['bʌfə(r)]

*n.* 商标; 牌子  
面包板  
桥式整流器  
*n.* 缓冲器;  
*v.* 缓冲  
标准部件

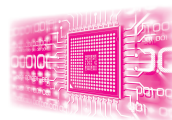
building block  
built-in  
bus [bʌs]  
buzzer ['bʌzə(r)]

*a.* 嵌入的; 内置的  
*n.* 总线  
*n.* 蜂鸣器

## C

capacitor [kə'pæsɪtə(r)]  
careless ['keələs]  
case [keɪs]  
cathode ['kæθəʊd]  
cathode ray tube  
cell [sel]  
century ['sentʃəri]  
charge [tʃ :dʒ]

*n.* 电容器  
*a.* 粗心的  
*n.* 容器 (箱, 盒)  
*n.* 阴极; 负极  
阴极射线管  
*n.* 电池; 细胞  
*n.* 世纪  
*v.* 使充电;



chipset	[ˈtʃɪpset]
classify	[ˈklæsɪfaɪ]
coil	[kɔɪl]
collector	[kəˈlektə(r)]
color band	
combinational	[ˌkɒmbɪˈneɪʃənəl]
complicated	[ˈkɒmplɪkeɪtɪd]
component	[kəmˈpəʊnənt]
condenser	[kənˈdensə(r)]
constant	[ˈkɒnstənt]
construct	[kənˈstrʌkt]
content	[ˈkɒntent]
continually	[kənˈtɪnjuəli]
convenient	[kənˈviːniənt]
convey	[ˈkɒnveɪ]
count	[kaʊnt]
CPU	
cut-off	[kʌt ɔf]
cycle	[ˈsaɪkl]

## D

damage	[ˈdæmɪdʒ]	v.	毁坏; 损坏
DC			直流电
decision-making circuit			判断电路
decoupling	[dɪˈkʌplɪŋ]	n.	退耦 (装置)
decrease	[dɪˈkriːs]	v.	减小; 减少
define	[dɪˈfaɪn]	v.	下定义

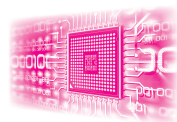
n.	电荷
n.	芯片组
v.	分类
n.	线圈
n.	(晶体管) 集电极
	色环
a.	组合的
a.	结构复杂的
n.	元器件
n.	电容器
a.	不断的; 永恒的;
n.	常数; 常量
v.	构成
n.	内容
ad.	持续地
a.	方便的
v.	输送; 传导
n.	总数;
v.	计数
	中央处理器
n.	截止
n.	循环; 周期



describe	[dɪ'skraɪb]	v.	描述; 形容
detector	[dɪ'tektə(r)]	n.	探测器; 检波器
development	[dɪ'veləpmənt]	n.	发展
dielectric	[,daɪɪ'lektrɪk]	n.	电解质
digital	['dɪdʒɪtl]	a.	数字的
diode	['daɪəʊd]	n.	二极管
disconnect	[,dɪskə'nekt]	v.	切断; 断开
discount	['dɪskaʊnt]	v.	打折扣
discrete	[dɪ'skri:t]	a.	分离的; 分立式
dishwasher	['dɪʃwɒʃə(r)]	n.	洗碗机
Disk Operation System			磁盘操作系统
document	['dɒkjumənt]	n.	文档

## E

earth	[ɜ:θ]	v.	(把电线) 接地
electricity	[ɪ,lek'trɪsəti]	n.	电学
electrolytic	[ɪ,lektərə'laɪtɪk]	a.	电解的
electronic	[ɪ,lek'trɒnɪk]	a.	电子的
electronic diagram			电子电路图
electronic symbol			电子符号
electronics	[ɪ,lek'trɒnɪks]	n.	电子学
emergency	[ɪ'mɜ:dʒənsi]	n.	紧急情况
EMF			电动势
emit	[ɪ'mɪt]	v.	发出; 发射
energy	['enədʒi]	n.	能量
energy	['enədʒi]	n.	能量; 能源
equipment	[ɪ'kwɪpmənt]	n.	设备; 装备; 器材
equipment	[ɪ'kwɪpmənt]	n.	设备; 装备
etch	[etʃ]	v.	侵蚀



exchange	[ɪks'tʃeɪndʒ]	<i>v.</i>	调换; 交换
exclusive	[ɪk'skluːsɪv]	<i>a.</i>	专用的; 排外的
expect	[ɪk'spekt]	<i>v.</i>	期望; 预期
experimental	[ɪk'sperɪ'mentl]	<i>a.</i>	实验性的
external	[ɪk'stɜːnl]	<i>a.</i>	外面的; 外部的

## F

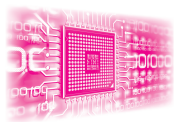
field	[fiːld]	<i>n.</i>	场地; 电场
fluctuation	[ˌflʌktʃʊ'eɪʃn]	<i>n.</i>	波动; 涨落
folding	['fəʊldɪŋ]	<i>a.</i>	可折叠的
frame	[freɪm]	<i>n.</i>	框架
frequency	['friːkwənsi]	<i>n.</i>	频率
function	['fʌŋkʃn]	<i>n.</i>	功能, 函数
function generator			函数(信号)发生器
fuse	[fjuːz]	<i>n.</i>	保险丝; 熔断器;
		<i>v.</i>	熔化; 融合

## G

gate	[geɪt]	<i>n.</i>	门
gigahertz	['gɪgəhɜːts]	<i>n.</i>	千兆赫
graceful	['greɪsfl]	<i>a.</i>	优美的; 优雅的
grid	[grɪd]	<i>n.</i>	栅格

## H

hard disk			硬盘
hardware	['hɑːdweə(r)]	<i>n.</i>	计算机硬件
heatsink	[hiːt sɪŋk]	<i>n.</i>	吸热装置; 散热片
holder	['həʊldə(r)]	<i>n.</i>	支持物



household

*a.* 家庭的; 家常的;  
*n.* 家庭

## I

in addition to

*ad.* 除...之外

in nature

实际上; 性质上

in series

串联

increase

[In'kri:s]

*v.* 增加; 增大

inductor

[In'dʌktə]

*n.* 电感器

inexpensive

[,Inɪk'spensɪv]

*a.* 不贵的; 便宜的

infra-red

['ɪnfrə'red]

*a.* 红外线的

inject

[In'dʒekt]

*v.* 注射

instruction

[In'strʌkʃn]

*n.* 指令

instrument

['ɪnstrəmənt]

*n.* 仪器; 仪表

integrated circuit

集成电路

interference

[,ɪntə'fɪərəns]

*n.* 干涉; 干扰

introduction

[,ɪntrə'dʌkʃn]

*n.* 引入

invention

[In'venʃn]

*n.* 发明

inverter

[In'vɜ:tə]

*n.* 反相器; 逆变器

## K

keyboard

['ki:bɔ:d]

*n.* 键盘

kilohm

['kɪləʊm]

*n.* 千欧姆

## L

laptop

['læptɒp]

*n.* 便携式电脑

lead

[li:d]

*n.* 引线; 表笔

light-dependent resistor

*n.* 光敏电阻

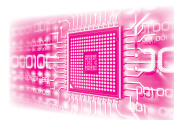
light-emitting diode

发光二极管

liquid crystal

['likwɪd 'krɪstəl]

液晶



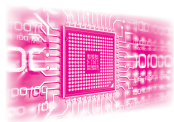
live	[lɪv]	<i>n.</i>	火线
logic	['lɒdʒɪk]	<i>n.</i>	逻辑; 逻辑学

## M

magnetic	[mæɡ'nɛtɪk]	<i>a.</i>	有磁性的;
		<i>n.</i>	磁; 磁力
main board			计算机主板
maintaining	[meɪn'teɪnɪŋ]	<i>v.</i>	保持; 保养
measure	['meɪʒə(r)]	<i>n.</i>	测量; 测度;
		<i>v.</i>	测量; 估量
megavolt	['megəvəʊlt]	<i>n.</i>	兆伏
metallic	[mə'tælɪk]	<i>a.</i>	金属的
microelectronics	[ˌmaɪkrəʊˌlek'trɒnɪks]	<i>n.</i>	微电子学
microfarad	[ˌmaɪkrəʊ'færəd]	<i>n.</i>	微法拉
microhenry	['maɪkrəhenrɪ]	<i>n.</i>	微亨利
microphone	['maɪkrəfəʊn]	<i>n.</i>	麦克风; 话筒
microprocessor	[ˌmaɪkrəʊ'prəʊsesə(r)]	<i>n.</i>	微处理器
microwave	['maɪkrəweɪv]	<i>n.</i>	微波
milliwatt	['mɪlɪwɒt]	<i>n.</i>	毫瓦
mobile	['məʊbaɪl]	<i>a.</i>	可移动的
monitor	['mɒnɪtə(r)]	<i>n.</i>	监视器; 显示器
mount	[maʊnt]	<i>v.</i>	安装
mouse	[maʊs]	<i>n.</i>	鼠标
multimedia	[ˌmʌltɪ'mɪ:diə]	<i>n.</i>	多媒体
multimeter	['mʌltɪmɪ:tə]	<i>n.</i>	万用表

## N

NAND gate			与非门
nanofarad	['neɪnə'færəd]	<i>n.</i>	纳法拉, 毫微法



needle ['ni:dl]  
negative ['negətiv]  
NOR gate  
NOT gate

拉  
*n.* 针; 指针  
*a.* 负的  
或非门  
非门

## O

OR gate  
oscillator ['ɒsɪleɪtə(r)]  
oscilloscope [ə'sɪləskəʊp]

或门  
*n.* 振荡器  
*n.* 示波器

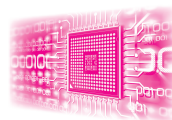
## P

package ['pækɪdʒ]  
passive ['pæsɪv]  
peak voltage  
peak-peak  
voltage  
perform [pə'fɔ:m]  
permanent ['pɜ:mənənt]  
picofarad [pɪkə'færəd]

*v.* 包装; 封装  
*a.* 无源的; 被动的  
峰值电压  
峰—峰值电压  
*v.* 执行  
*a.* 永久性的  
*n.* 皮法拉, 微微法  
拉

pin-out diagram  
plug [plʌg]  
portable ['pɔ:təbl]  
position [pə'zɪʃn]  
positive ['pɒzətɪv]  
potential  
difference  
potential divider

引脚图  
*v.* 插入  
*a.* 便携式的  
*n.* 位置  
*a.* 正的  
电位差  
*n.* 电势分配器; 分压器

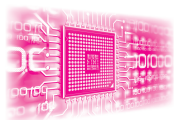


potentiometer	[pəˌtenʃi'ɒmɪtə(r)]	<i>n.</i>	电位计
power amp			功率放大器
precaution	[prɪ'kɔːʃn]	<i>n.</i>	预防, 防备
principle	['prɪnsəpl]	<i>n.</i>	原则; 原理
printer	['prɪntə(r)]	<i>n.</i>	打印机
program	['prəʊgræm]	<i>n.</i>	程序
property	['prɒpəti]	<i>n.</i>	特性; 属性
pulse	[pʌls]	<i>n.</i>	脉冲; 脉搏;

## R

radiation	[ˌreɪdɪ'eɪʃn]	<i>n.</i>	辐射; 放射
RAM			随机存取存储器
random	['rændəm]	<i>a.</i>	随机的; 任意的
range	[reɪndʒ]	<i>n.</i>	范围; 量程
rate	[reɪt]	<i>n.</i>	速度; 速率
receipt	[rɪ'si:t]	<i>n.</i>	收据; 发票
receiver	[rɪ'si:və(r)]	<i>n.</i>	接收机; 接收器
recommend	[ˌrekə'mend]	<i>v.</i>	推荐
record player			留声机
rectifier	['rektɪfaɪə]	<i>n.</i>	整流器
relative to			关于 ..... 的; 和.....比较起来
relax	[rɪ'læks]	<i>v.</i>	(使)放宽
relay	['ri:leɪ]	<i>n.</i>	继电器
remote	[rɪ'məʊt]	<i>a.</i>	遥远的; 远程的
remote control		<i>n.</i>	遥控
represent	[ˌreprɪ'zent]	<i>v.</i>	象征; 代表
resistor	[rɪ'zɪstə(r)]	<i>n.</i>	电阻器
restrict	[rɪ'strɪkt]	<i>v.</i>	限制; 限定; 约束





reverse

[rɪ'vɜ:s]

*v.* (使)反转; (使)颠倒

ROM

只读存储器

## S

saturation

[,sætʃə'reɪʃn]

*n.* (达到)饱和状态

scale

[skeɪl]

*n.* 刻度; 规模; 比例

scanner

['skænə(r)]

*n.* 扫描设备

security

[sɪ'kjʊərəti]

*n.* 安保

semiconductor

[,semikən'dʌktə(r)]

*n.* 半导体

sensing

[sensɪŋ]

*n.* 传感

sensitivity

[,sensə'tɪvəti]

*n.* 灵敏度; 敏感度

signal

['sɪgnəl]

*n.* 信号

silicon

['sɪlɪkən]

*n.* 硅; 硅元素

silicon chip

硅片

sine wave

正弦波

smoothing

['smu:ðɪŋ]

*n.* 滤波;

*v.* (使)光滑; (使)平坦

software

['sɒftweə(r)]

*n.* 计算机软件

soldering

['sɒldərɪŋ]

*n.* 锡焊;

*v.* 焊接

speaker

['spi:kə(r)]

*n.* 扬声器

square

[skweə(r)]

*a.* 正方形的

stabilizing

['steɪbəlaɪzɪŋ]

*n.* 稳定化处理;

*v.* (使)稳定

stated value

标称值

step down

降压

stereo

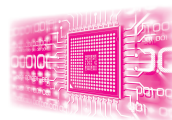
['steriəʊ]

*n.* 立体声系统

storage

['stɔ:ɹɪdʒ]

*n.* 储存



stripboard

带形板

supply rail

电源导轨

surf [sɜ:f]

v. (互联网上)冲浪

switch [switʃ]

n. 开关; 转换;

v. 转变; 改变

symbol ['sɪmbəl]

n. 符号; 象征;

v. 用符号代表

system software

系统软件

## T

tape recorder

磁带录音机

temporary ['tempərəri]

a. 临时的

terminal ['tɜ:mɪnəl]

n. (电路的)端子

thermistor [θɜ:'mɪstə]

n. 热敏电阻

timer ['taɪmə(r)]

n. 定时器, 计时器

timing ['taɪmɪŋ]

n. 计时; 定时

tolerance ['tɒlərəns]

n. 公差; 允许误差

torch [tɔ:tʃ]

n. 手电筒

trace [treɪs]

v. 跟踪; 追踪;

n. 踪迹; 轨迹

transducer [trænz'dju:sə(r)]

n. 传感器; 变频器

transfer [træns'fɜ:(r)]

v. 转移; 传递

transformer [træns'fɔ:mə(r)]

n. 变压器

transistor [træn'zɪstə(r)]

n. 晶体管; 三极管

transmitter [træns'mɪtə(r)]

n. 发射机; 发送器

triangular [traɪ'æŋgjələ(r)]

a. 三角(形)的

troubleshooting ['trʌblʃu:tɪŋ]

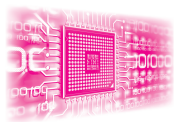
n. 排错; 检修

truth table

真值表

tuner ['tju:nə(r)]

n. 调谐器



## U

usage ['ju:sɪdʒ] *n.* 使用; 用法

## V

vacuum tube

value	['vælju:]	<i>n.</i>	值; 价值
valve	[vælv]	<i>n.</i>	阀, 真空管
variable resistor		<i>n.</i>	可变电阻
vast	[v :st]	<i>a.</i>	广阔的; 巨大的
violet	['vaɪələt]	<i>a.</i>	紫色的
visible	['vɪzəbl]	<i>a.</i>	可见的; 看得见的
visual	['vɪʒuəl]	<i>a.</i>	视觉的; 看得见的
volume	['vɒlju:m]	<i>n.</i>	音量, 体积

## W

washing-machine	['wɒʃɪŋməʃ'i:n]	<i>n.</i>	洗衣机
wave	[weɪv]	<i>n.</i>	波; 波动
waveform	['weɪvɔ:m]	<i>n.</i>	波形
winding	['waɪndɪŋ]	<i>n.</i>	绕组
wiper	['waɪpə(r)]	<i>n.</i>	滑片

## X

XOR gate 异或门

## Z

zener diode 齐纳二极管

# Appendix B

## Translation of the Texts and Keys to the Exercises

### Unit 1 Electronics in The Home



#### 参考译文

#### 家庭中的电子学

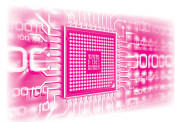
电子学开始于 20 世纪初期的电子管的发明。日常使用的第一项发明是收音机，其后电视机、留声机和磁带录音机相继问世。这些设备体积大，而且非常耗电。

1947 年，晶体管的发明意味着体积较小、功耗较低的设备能够发展起来。各种形式的电子设备在家庭中变得很普遍，例如高保真的组合音响和便携式收音机等。

直到 1958 年，随着硅片集成电路 (ICs) 的发展而产生了微电子学。这导致电子学在日常事务中有了巨大的发展。微处理器的引入允许电子学运用于对许多一般过程的控制。

现在，微处理器被用于控制许多家务项目，例如自动洗衣机、洗碗机、中央加热系统和食品加工器等。数字闹钟、热水器和微波炉都安装了电子计时器。

将来，当多媒体娱乐系统和计算机控制的机器人发展起来时，电子学有可能在家庭中变得更加普遍。



## 电学和电子学

电学是一门研究产生热、光及驱动机器能量的科学；而电子学是关于电子装置的研究和应用的科学。这些电子装置有电子管、晶体管、集成电路等。1800 年，伏特做成了试验电池，产生了一个恒定的电流，奠定了电学的基础。电学和电子学的研究是不同的，但是它们之间有着密切的联系。许多原理在这两个领域中都是通用的。



## 参考答案

### Task 1 Match the types of the devices to the pictures.

1. vacuum tube
2. transistor
3. tape recorder
4. microprocessor
5. wash-machine
6. microwave oven

### Task 2 Fill in the gaps in this table with the help of the text.

Date	Invention	Applications in the home
Early 20 <sup>th</sup> century	vacuum tube	Radios
1947	transistor	portable radios
1958	ICs	automatic washing-machines
Future	-	computer-controlled robots

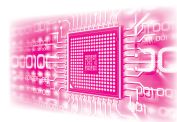
### Task 3 Make your choice according to the passage.

1. A
2. B
3. B

### Task 4 Look and write.

1. Susan doesn't watch TV every evening.
2. What are you doing in the playground?





3. Did you go to school early yesterday?
4. No, they won't.
5. The bus has been here for ten minutes.

### Task 5 Think and complete .

- |                      |                      |                    |
|----------------------|----------------------|--------------------|
| 1. has ;             | 2. Will...buy ;      | 3. haven't found ; |
| 4. was ;             | 5. aren't watering ; | 6. Do...have ;     |
| 7. are dancing ;     | 8. Did...come ;      | 9. have...seen ;   |
| 10. will not believe |                      |                    |

### Task 6 Try to match the following columns.

1. c ; 2. b ; 3. f ; 4. e ; 5. a ; 6. d

### Task 7 Try to match the following columns.

1. d ; 2. c ; 3. a ; 4. b

## Unit 2 Component Values



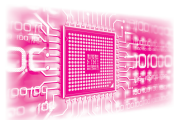
### 参考译文

#### 读电阻代码

用一些色环把电阻编成代码，这使得标识如此小的元件变得容易。10 个数字与 10 种所用颜色一一对应，而且每个位置的值已在上面标出。

例如，180k $\Omega$  的电阻代码为：第一种颜色是棕色，然后是灰色，最后是黄色。第四个色环表面该电阻实际值相对于标准值的允许误差。例如，银色表示 10% 的偏差，这就意味着标值 180k $\Omega$  的电阻，其阻值可在 180k $\Omega$ ±18k $\Omega$  之间变化，也就是说，从 162k $\Omega$  到 198k $\Omega$ 。

这些允许误差似乎反映了制作质量的好与差，但是在大多数使用它们的电路中都能满足要求。放宽这个允许误差，使得制造商能够以更便宜的价格出售它们。



## 理解电路图

尽管电子设备看起来复杂,但它们是由通用的基本单元(标准部件)连在一起组成的。每一个单元的功能和它们之间信号的路径可用一个方框图来说明。例如,一个简单收音机的方框图如图 1 所示。

若想了解收音机是怎样工作的,了解每一个单元的功能比知道使用什么元件更为重要,这就是所谓用系统的方法来认识电子学。例如,图 1 中的调谐器(tuner)用于选择所需要的信号,然后检波器(detector)从该信号中分离出音频信号部分,经音频放大器(AF amp)把它放大。

这些基本单元内部元件的连接和数值可由标准电子符号表示的电路图中给出。如图 2 所示为某个简单收音机的电路图。

音频控制部分是由一个  $10\mu\text{F}$  的电解电容与一个  $5\text{K}\Omega$  的分压电阻串联组成。这个电容器的正极端接在音频放大器的输出端,分压电阻的滑片接到功率放大器上。该分压电阻的第三个端点接到外壳提供的零电位上,即接地。



## 参考答案

**Task 1** Fill in the missing colors in the table with the help of the text.

0—black    1—brown    2—red    3—orange    4—yellow  
5—green    6—blue    7—violet    8—grey    9—white

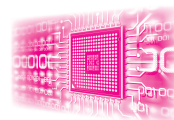
**Task 2** Find the values and tolerance of resistors banded as follows. Then compare your answer with your partner.

1.  $27 \times 10^3 \pm 10\% \Omega$
2.  $68 \times 10^1 \pm 5\% \Omega$
3.  $56 \times 10^2 \pm 10\% \Omega$
4.  $22 \times 10^5 \pm 20\% \Omega$
5.  $10 \times 10^3 \pm 20\% \Omega$
6.  $33 \times 10^1 \pm 5\% \Omega$
7.  $43 \times 10^2 \pm 5\% \Omega$
8.  $15 \times 10^5 \pm 20\% \Omega$
9.  $75 \times 10^1 \pm 2\% \Omega$
10.  $91 \times 10^2 \pm 2\% \Omega$

**Task 3** Find the statements that are passive voice.

1.    2.    4.    5.





### Task 4 Fill in the blanks with the correct form of the verb.

- |                  |                 |                |
|------------------|-----------------|----------------|
| 1. was created   | 2. learned      | 3. be produced |
| 4. were          | 5. was invented | 6. were made   |
| 7. was developed | 8. be produced  | 9. learned     |

### Task 5 This table provides the terms you need. Describe the value of these components with the help of the table.

R1	a two-hundred-and twenty-kilohm resistor
C1	a five to sixty-five-picofarad variable capacitor
R2	a forty-seven-kilohm resistor
C2	a one-microfarad capacitor
L1	a four-hundred and seventy-nanohenry inductor
R3	a one-kilohm resistor

### Task 6 Describing block diagrams and circuits, fill in the gaps in this description of the tuned circuit shown in Fig.2. Each gap represents one word.

- |              |                |              |
|--------------|----------------|--------------|
| 1. consists  | 2. nanohenries | 3. variable  |
| 4. capacitor | 5. picofarads  | 6. connected |
| 7. diode     |                |              |

## Unit 3 Electronic Components

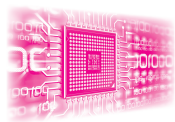


### 参考译文

#### 认识电子元器件

有大量的符号代表了同样大范围的电子元件。能够识别更多的普通元件以及了解它们的实际用途是很重要的。下面画出了一些电子元件，有趣的是一种类型的元件，常常可以用多种符号表示。





## 电阻

电阻阻碍电流的运动。例如一个电阻与一个发光二极管 LED 串联来限制通过 LED 的电流。图 1 为电阻实物图和电路符号。电阻可以连接在任一回路中。它们不会因焊接高温而损坏。

## 电容

电容存储电荷。因为电容允许交流信号通过而阻隔直流信号。所以它们经常被用在滤波电路中。图 2 为电容实物图和电路符号。

## 电感

电感是一个无源电子元件，它以磁场的形式存储能量。电感是一个由电线缠绕而成的线圈，经常缠绕在磁性材料的磁芯上如铁。图 3 为电感实物图和电路符号。

## 二极管

二极管允许电流仅从一个方向流过。电路符号的箭头指示了电流能流过的方向。二极管是真空管的电子版，实际上，早期的二极管就叫真空管。图 4 为二极管实物图和电路符号。

## 晶体管

标准的晶体管有两种类型，NPN 型和 PNP 型。它们的电路符号不同。字母 N 和 P 意味着制造晶体管的半导体材料不同。图 5 为晶体管实物图和电路符号。

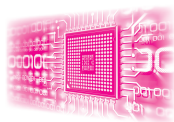
## 集成电路（芯片）

集成电路通常被称为 ICs 或芯片。它们是固化在微小的半导体（硅）芯片上的复杂电路。该芯片被封装在一个塑料固定物上，引脚间距为 0.1 英寸（2.54mm），适合带形板和面包板的孔距。内部用非常纤细的导线连接芯片的引脚。图 6 为集成电路实物图。

## 发光二极管（LEDs）

当电流流过发光二极管时，发光二极管发光。LEDs 接入回路时必须连接正确，电路图中可以用“A”或者“+”表示阳极，用“K”或者





“ - ”表示阴极。阴极是短的引脚，并且在 LEDs 圆形体内可能是微小扁平的那一端。图 7 为 LED 实物图和电路符号。

## 电容器

电能可以被储存在电场中，能储存电能的元件叫做电容器。

一个简单的电容器是由被介质隔离开的两块金属板组成的。如果电容器连接到电池上，电子将从电池的负极流出堆积在与负极相连的极板上。同时与电源正极相接的极板上的电子将离开极板流入电池正极。这样两极板上就产生了与电池上相等的电位差，我们就说电容充上了电。

用一根导线连接电容器的两个极板，电容就会放电。电子从一个极板通过导线向另一个极板运动去恢复电中性。



## 参考答案

### Task 1 Match the types of the components to the pictures.

- |             |                       |               |
|-------------|-----------------------|---------------|
| 1. resistor | 2. integrated circuit | 3. transistor |
| 4. inductor | 5. capacitor          | 6. diode      |

### Task 2 Write T (True) or F (False) beside the following statements about the text.

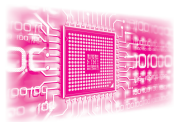
1. F 2. F 3. F 4. T 5. F 6. T 7. F 8. T 9. T 10. F

### Task 3 Match the following terms to appropriate definition or expression.

1. d 2. c 3. a 4. b

### Task 4 Fill in the missing words according to the text:

- |              |                |                     |
|--------------|----------------|---------------------|
| 1. resistors | 2. A capacitor | 3. a magnetic field |
| 4. direction | 5. cathode     |                     |



### Task 5 Read and decide.

1. 作人称代词, 指事物。
2. 作非人称代词, 指天气。
3. 作形式主语, 代替不定式。
4. 作形式宾语, 代替不定式。
5. 作形式主语, 代替从句。
6. 强调句型, 强调时间状语。
7. 作人称代词, 指人。
8. 作形式主语, 代替动名词短语。
9. 作形式宾语, 代替从句。
10. 强调句型, 强调主语。

### Task 6 Choose the best answer.

1. B    2. C    3. A    4. D    5. D

### Task 7 Complete the following statements with a,b, or c, score one mark for each correct answer.

1. C    2. C    3. A

## Unit 4 Battery Charger



### 参考译文

#### 电池充电器

驱动一个电子电路的电源通常是交流电源,但对于便携式设备,经常使用的是电池。用过的电池能够再次充电到其原有的电压,因此,它们能够被重复多次使用。

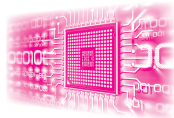
充电是使用一个电池充电器来进行的。该充电器由一个能提供稍大于需要充电电池电动势的直流输出的交流电源所组成。电流经驱动从与电池正常输出电流相反的方向通过电池。一个电池充电器的方框图如图 1 所示。

第一部分由一个变压器组成。该变压器把交流电源的电压降低(图 2)。

充电器的开与关是通过与交流输入电源串联的一个开关来实现的。一个保险丝接在交流电源的火线上,用于保护变压器。

第二部分是一个桥式整流器。它把交流电压转换成直流电压(图 3)。整流器由分立元件构成,但比较常用的是由四个二极管封装而成。





它装有一个铝质散热片以避免这些二极管过热。

第三部分是一个滤波电路。它把整流器直流输出中的波动剔除掉。它由一个并联于整流器的大电解电容组成，如图 4 所示。

最后一部分是一个稳压电路。它由一个被两个电阻和一个齐纳二极管加偏压的晶体管所组成。当负载变化时，它能阻止输出变化。镍铬电池的内阻太小，因此充电器必须输出一个稳恒的电流输出（图 5）。

### 电信号的特性

交流电流的方向从一个方向转换成另一个方向，持续不断地变换。电流电压会持续不断地在正负两个极性之间交替变换。这种方向变化的速率称为交流信号的频率，单位是赫兹，它表示一秒内周期性变化的次数。

直流电流总是向同一个方向流动，但它可能增大或者减小。直流电压总是正的（或总是负的），但它也可能增大或者减小。

电信号是传送信息的电压或电流，通常指电压。它可以被用于电路里的任何电压或电流。

如图 6 所示的电压—时间图显示了电信号的各种特性。除了图上标明的特性以外，还有频率，它表示每秒钟的周期数。该图显示了一个正弦波，但这些特性适用于具有特定形状的任何信号。

振幅是信号所达到的最大电压，单位是伏特(V)。峰值电压是振幅的另一个名称。峰—峰电压是峰值电压的两倍。示波器轨迹通常是用峰—峰电压来表示的。

周期是信号完成一个循环所需要的时间，单位是秒(s)。但是周期往往很短，所以就用毫秒(ms)和微秒( $\mu\text{s}$ )表示。

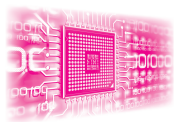
频率是每秒钟的周期数。单位是赫兹(Hz)。但是频率往往很高，通常用千赫和兆赫来表示。



### 参考答案

Task 1 Here are some circuit symbols. Label them and describe their function.

1.c 2.g 3.h 4.e 5.b 6.j 7.a 8.f 9.d 10.i



**Task 2** Each of these verbs has a related noun ending in -er or -or which refers to an instrument or component. Complete the column of verbs into nouns.

- |               |                |                |           |
|---------------|----------------|----------------|-----------|
| 1. oscillator | 2. transmitter | 3. transformer |           |
| 4. charger    | 5. rectifier   | 6. processor   |           |
| 7. amplifier  | 8. collector   | 9. detector    | 10. tuner |

**Task 3** Match each component or unit with its function in a battery charger.

- 1.a 2.g 3.e 4.f 5.c 6.d 7.b

**Task 4** Read and match.

1. b 2. d 3. a 4. f 5. c 6. e

**Task 5** Choose and complete.

1. to draw 2. to take 3. to do 4. to see 5. to watch

**Task 6** Write T (True) or F (False) beside the following statements about the text.

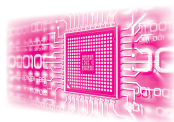
- 1.F 2.F 3.F 4.T

**Task 7** Fill in the missing words according to the text.

1. positive and negative 2. cycles 3. peak-peak 4. twice

**Task 8** Match the following terms to appropriate definition or expression.

- 1.b 2.c 3.d 4.a



## Unit 5 Alarm Systems



### 参考译文

#### 报警系统

一个简单报警系统的三个组成部分如图 1 所示。

第一部分是一个灵敏检测设备。当它检测到一种特别能量形式时，它的电阻阻值会发生变化。例如，麦克风可以用来探测声音，热敏电阻用于探测热量，或者光敏电阻用于探测光。

第二部分是一个电子开关。它最简单的形式是单个晶体管。当输入电阻发生变化时，该晶体管在截止和饱和之间切换。

第三部分是一个输出传感器。通过电子开关，发送器在开和关之间转换。输出传感器可以是蜂鸣器、光或者能驱动更大功率电路的继电器。

如图 2 所示是给出简单报警电路的一个例子。

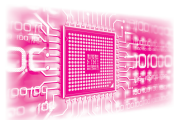
光敏电阻与可变电阻 RV1 构成了一个分压电路。当光照在光敏电阻上时，其电阻值下降。这就引起了晶体管基极电压和偏置电流的增加。晶体管导通，其集电极电流会迅速增大，直到晶体管达到饱和为止。这个增大的电流触发继电器工作，接通输出电路。输入灵敏度可以使用 RV1 进行调节。

类似地，当光源从光敏电阻上移开时，继电器退去能量。在继电器两端将产生一个大的反向电动势，它将毁坏晶体管。为了保护晶体管，在继电器两端连接一个反向偏置的二极管。

#### 遥控系统

一个简单遥控系统的方框图如图 3 所示。当发射机接通时，红外信号从发射机发射到接收器。脉冲信号用来防止任何经常发生的红外线背景“噪声”的干扰。

为了得到这些脉冲信号，首先要由发射机中的音频振荡器产生一个频率在音频范围之上的电脉冲信号。然后它们被缓冲放大器放大，使它们能够驱动发光二极管。最后，电脉冲信号通过该发光二极管转换成接



收器能直接接收的脉冲红外线辐射。几乎没有可见光从该发光二极管中发出。

一个遥控发射器的电路图如图 2 所示。

在这个电路中，振荡器和放大器两者均集成在一个单片集成电路 (IC1) 中。该振荡器的振荡频率通过外置计时元件 R1、R2 和 C2 来设定。该放大器的电流输出由与发光二极管串联的电阻 R3 来控制。该集成电路的脉冲输出所提供的直流电流的去耦由电解电容 C1 来提供。



## 参考答案

**Task 1** Each word in column A often goes before one word from column B. Find the other word pairs.

1.f 2.h 3.d 4.b 5.g 6.c 7.a 8.e

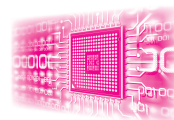
**Task 2** Use information from the text to complete the tables.

Sensing device	Used to detect
LDR	light
thermistor	heat
microphone	sound

**Task 3** Use words from the text to complete the following table.

Term	Opposite
cut-off	saturation
fixed resistor	variable resistor
increase	decrease
energize	de-energize
slow	rapid
forward bias	reverse bias





### Task 4 Choose and complete.

1. needn't      2. could      3. must  
4. can          5. shouldn't      6. may

### Task 5 Read and match.

1. b    2. a    3. e    4. c    5. d    6. f

### Task 6 Fill the gaps in this diagram with the help of the text.

Stage	Function
audio oscillator	generates electrical pulses
buffer amplifier	amplifies pulses to drive the LED
LED	converts pulses into pulsed infra-red radiation

### Task 7 Now fill in the gaps in this diagram with the help of the text.

Components	Function
IC1	oscillator and amplifier
R1,R2 and C2	frequency control
R3	current output control
C1	decoupling of DC supply

## Unit 6 Test and Repair Instruments



### 参考译文

#### 测试和修理仪器

测试和测量在所有种类的电工、电子产品和电路系统的设计、维护、故障处理和维护服务中是十分重要的。下列仪器常用于电子线路的测试





和修理。

### 万用表

这种仪器能用于测量许多不同的电学参量，如电压、电流和电阻，也就是说，它是伏特表、安培表和欧姆表的组合。万用表是一种简单、便宜的电子测量仪器。几乎任何人在几分钟内就能学会使用它。你可以用它来排除故障、检验熔丝、测量电压、检查导线和开关等。万用表有模拟或数字显示，而且能在不同的量程之间实现切换。

### 示波器

这种仪器常用于测量快速变化的信号。它能显示信号随时间的变化或者与另一信号的关系。它使用了一个阴极射线管把被测信号的波形在显示屏上显示出来。现在大多数示波器中的阴极射线管都由液晶显示器代替，因为液晶显示器大大减少了示波器的重量和体积。

### 函数发生器

这种仪器装有一个三角波振荡器，且该振荡器能切换成一定频率范围的三角波、方波或正弦波。它通常用来检测和调节各种电子设备，如音频放大器。函数发生器提供能注入电路的一个已知信号。它常常和示波器一起使用，以使波形清晰可见。

### 万用表及其使用

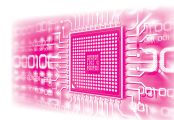
万用表是非常有用的测量仪器，通过调节万用表的多用开关，可以快捷而方便地将其设置为电压表、电流表或欧姆表。每种类型的仪表都有几种挡位选择（称为量程），还可以选择交流和直流。有些万用表还有一些其他功能，如晶体管的判别，电容量和频率范围的测量等。

万用表有两种类型：数字型和模拟型。模拟万用表用指针显示，数字万用表用液晶显示。

用万用表测量电压和电流的步骤。

1. 根据预期的读数范围选择大一级的量程；
2. 连接仪表，确保万用表的表笔以正确的方式接入回路。如果接反了，数字万用表可能是安全的，而模拟表则可能损坏；
3. 如果读数超出刻度范围，须立即断开，选择更高一级的量程。





万用表若使用不当很容易损坏，请采取以下措施预防。

1. 在调节量程前，保持万用表处于断开状态；
2. 在测量前检查量程设置；
3. 绝不把万用表设置在电流挡（除非实际要测量电流）。因为万用表电流挡的电阻较小，所以在电流挡时万用表最容易损坏。



## 参考答案

**Task 1** Match the types of the instruments to the pictures.

1.d 2.a 3.c 4.b

**Task 2** Which of the instruments would you use to do the following operations?

1. multimeter
2. function generator and oscilloscope
3. multimeter
4. oscilloscope

**Task 3** Make your choice according to the text.

1. A 2. A 3. B 4. B

**Task 4** Try to match the following columns.

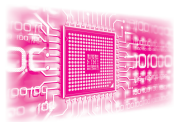
1. c 2. e 3. f 4. a 5. g 6. d 7. b

**Task 5** Choose the best answer..

1. A
2. D
3. B
4. A
5. C
6. C
7. B
8. C
9. A
10. D

**Task 6** Think and complete.

1. When I get lost, I will call my friend.
2. We have to delay our journey because the weather is so bad.
3. I opened the window so that fresh air might come in.
4. I will go to school tomorrow unless I have a bad cold.



5. Although she is young, she knows quite a lot.

**Task 7** Write T (True) or F (False) beside the following statements about the text.

1.F 2.F 3.T 4.T

**Task 8** Fill in the missing words according to the text.

1. voltmeter ammeter ohmmeter
2. ranges AC DC
3. transistor testing frequency
4. digital analog
5. maximum greater
6. precaution

## Unit 7 Digital Circuit



### 参考译文

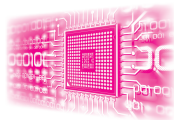
#### 组合逻辑电路

现代计算机的判断电路主要由称之为逻辑门的数字开关电路组成。图 1 给出了一些基本逻辑门的逻辑符号和真值表。

每个门的输出取决于其输入的组合，这叫做组合逻辑。对所有可能输入的输出用一个真值表表示。真值表表明，当一个“与”门的所有输入都是高电位时，其输出只能是高电位。而一个“非”门（也称为反相器）的输出总是与其输入相反。

计算机使用的集成电路中包含有由大量逻辑门组成的芯片。集成电路的引脚图显示了各门电路的排列和芯片上每个引脚的功能（图 2）。

计算机中使用集成电路的数目，也就是说芯片数，能通过把“与非”门连接在一起形成其他形式的门电路而减少门电路的数量（图 3）。



## 数字电路

数字信号和数字电路是个广泛而重要的课题。数字信号性质上是二值的，即在两个明确定义的范围内取一个值：0 或者 1。

数字系统被认为是使用逻辑门电路组成的。门电路有与门、或门、非门、与非门、或非门和异或门。可以用真值表表示逻辑门电路的功能。

通过真值表可以描述逻辑门电路的基本操作，如下所示。

### 1. 与门

当且仅当所有的输入端都是高电平（逻辑“1”）时，与门的输出端也为高电平。

### 2. 或门

当输入端有一个或多个是高电平（逻辑“1”）时，或门的输出端就为高电平。

### 3. 非门

非门是一种将输入信号取反的电路，有时也称为反相器。

### 4. 与非门

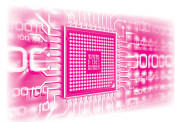
与非门等于是在与门后加一个非门。只要任意一个输入端有低电平，其输出端就是高电平。与非门的符号是在与门的输出端有一个小圆圈。小圆圈代表反相。

### 5. 或非门

或非门等于是在或门后加一个非门。只要任意一个输入端有高电平，其输出端就是低电平。或非门的符号是在或门的输出端有一个小圆圈。小圆圈代表反相。

### 6. 异或门

当异或门的某一个输入端是高电平，而不是所有两个输入端都是高电平时，它的输出端就是高电平。



## 参考答案

**Task 1** Match each logic gate with its truth table for each of the following.

1.b 2.c 3.e 4.d 5.a 6.f

**Task 2** Write T (True) or F (False) beside the following statements about the text.

1.T 2.F 3.F 4.F 5.T 6.T

**Task 3** Read and complete.

1. discussed 2. killing 3. borrowing 4. repaired 5. cheating  
6. calling 7. raised 8. made of 9. playing 10. Seeing

**Task 4** Choose the best answer.

1. B 2. C 3. A 4. D 5. A

**Task 5** Try to match the following columns.

1.d 2.c 3.a 4.e 5.f 6.b

**Task 6** Combine the half statement in the number order with those in the alphabetic order.

1.b 2.a 3.e 4.c 5.d

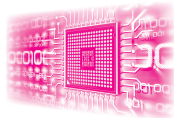
## Unit 8 Computer



## 参考译文

### 微型计算机系统

如图 1 所示为一个微型计算机系统的方框图。



输入/输出单元 (I/O) 由一个或多个集成电路构成的, 它们控制计算机的进和出。

只读存储器 (ROM) 和随机存取存储器 (RAM) 单元由大量能存储程序和数据的特殊数字逻辑芯片组成。小的只读存储器提供一些永久性存储, 而随机存取存储器用于临时存储, 不像 ROM, RAM 的内容是不断改变的, 只有当计算机接通电源时, 它才工作。

中央处理器 (CPU) 是一个微处理器。它是计算机最主要的部分, 它控制系统的其他部分, 并且对数据进行所有的算术和逻辑运算。

称为总线的几套连接器常用于各个单元之间传送内部信号。数据总线用于所有各单元之间传送数据。控制总线用于从中央处理器向其他单元发送控制信号。地址总线用来发送由 CPU 发出的用于标明存储和输入/输出位置的信号。

## 计算机

计算机有一个人所共知的雅号——电脑。这是因为计算机的工作过程与人脑的思维过程极为相似。

计算机由两部分组成: 硬件和软件。

硬件通常是指我们看得见、摸得着的部件, 如主机、键盘、显示器和鼠标等。打开主机箱, 你会看到主要的内置部件: 主板、中央处理器、硬盘、存储器、芯片组、电源盒输出接口。主要的输入设备有键盘、鼠标和扫描仪; 输出设备有显示器和打印机。

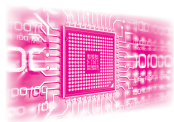
软件是指信息和指令。通常, 软件是计算机程序的别名。没有软件, 计算机就不能运行, 因此它和硬件一样重要。软件可以分为两类: 系统软件和应用软件。常用的软件有: 磁盘操作系统 (DOS), Windows 操作系统, 文字处理系统 (WPS) 和电路板绘制软件 Protel。



## 参考答案

Task 1 The following pictures are kinds of hardware. Do you know their English names?

- |             |               |            |
|-------------|---------------|------------|
| 1. keyboard | 2. monitor    | 3. scanner |
| 4. printer  | 5. main board | 6. mouse   |



## Task 2 Can you write the full form of these abbreviations?

1. RAM random- access memory
2. ROM read- only memory
3. CPU central processing unit
4. I/O input/output

## Task 3 Try to match the following columns.

1.c 2.e 3.a 4.g 5.d 6.f 7.b

## Task 4 Read and underline.

1. (Another thing) that I found very difficult was English test.
2. (The book) which is on the table is mine.
3. They said (something) you didn't like.
4. You couldn't understand (people) who talked fast.
5. (The woman) whom you saw is our English teacher.
6. (The boy) whose father is a teacher is good at English.
7. Can you think of (any problems) you have had recently?
8. My friends and I talked about (the rules) that we have in school.
9. (The man) whom I met yesterday lent me some money.
10. If you know (anyone else) who collects them, please tell me.

## Task 5 Choose and complete.

- |                |                  |                 |          |
|----------------|------------------|-----------------|----------|
| 1. whom / that | 2. which         | 3. which / that | 4. whose |
| 5. that        | 6. whose         | 7. who / that   | 8. which |
| 9. who / that  | 10. which / that |                 |          |

## Task 6 Try to match the following columns.

1.e 2.a 3.f 4.c 5.d 6.b

## Task 7 Make your choice according to the text.p6

1.C 2.C 3.A 4.A 5.C